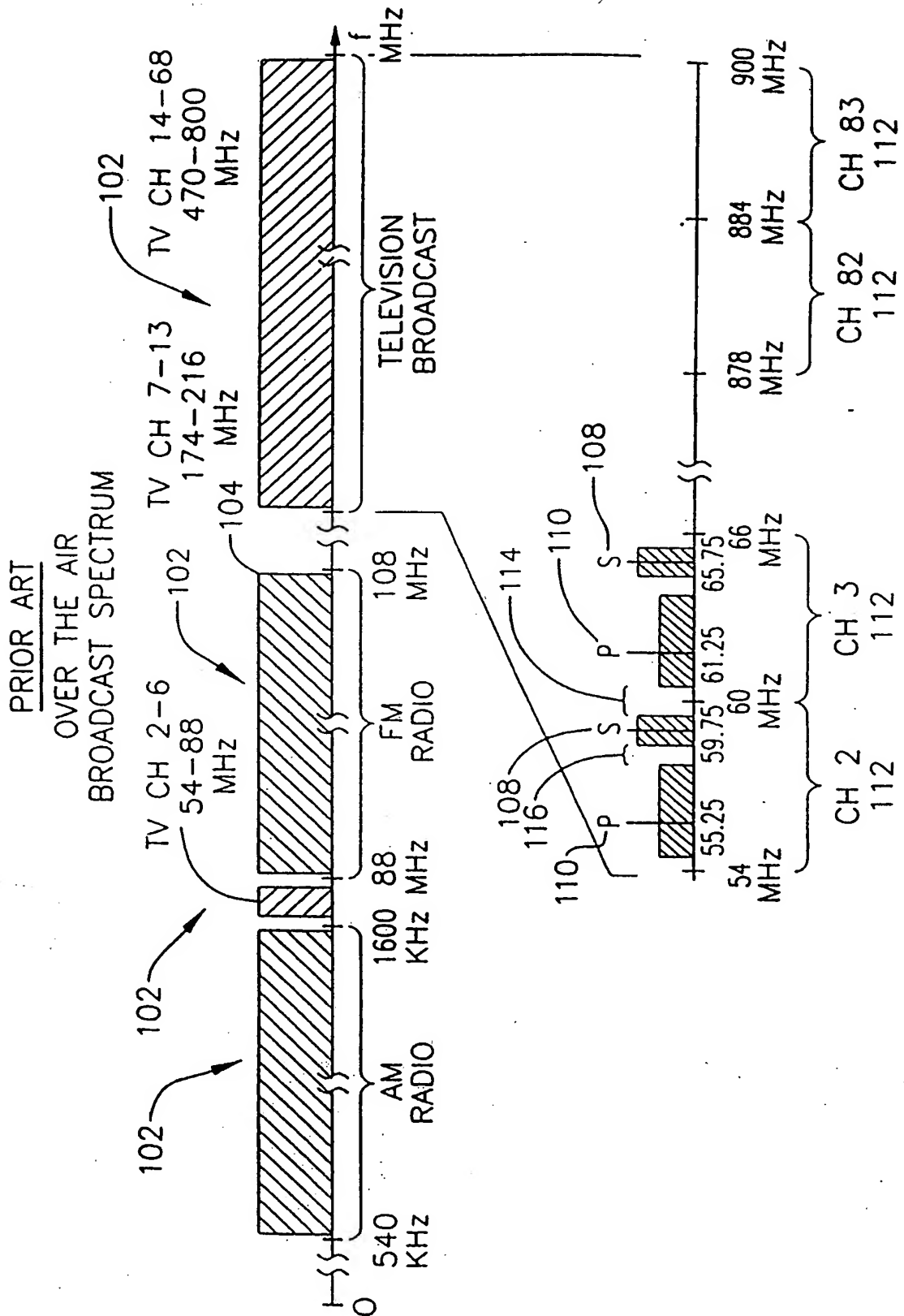


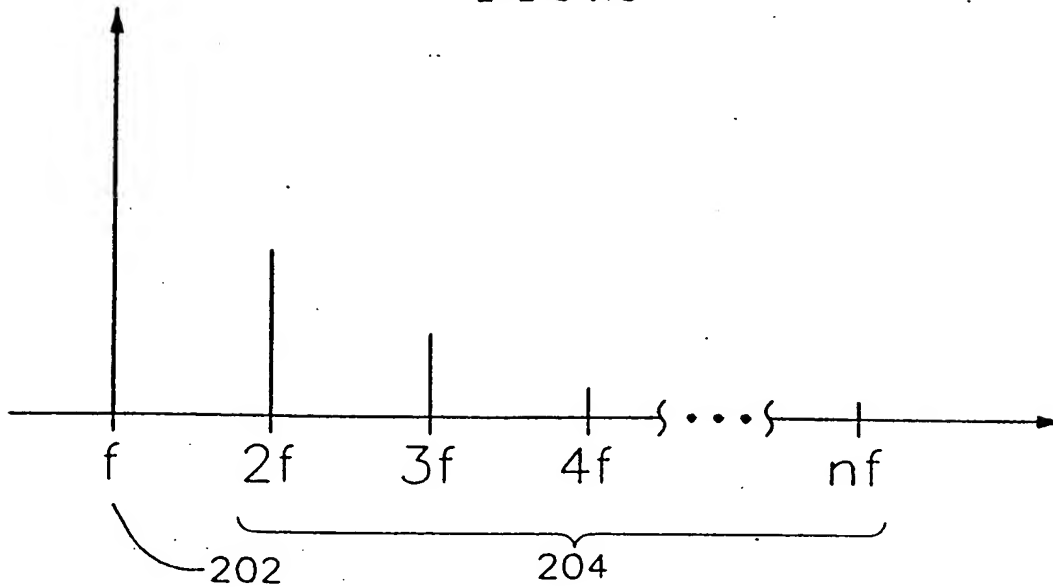
Appl. No. To Be Assigned; Filed: Herewith  
 Dkt. No. 1875.138000G; Group Art Unit: To Be Assigned  
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

FIG. 1



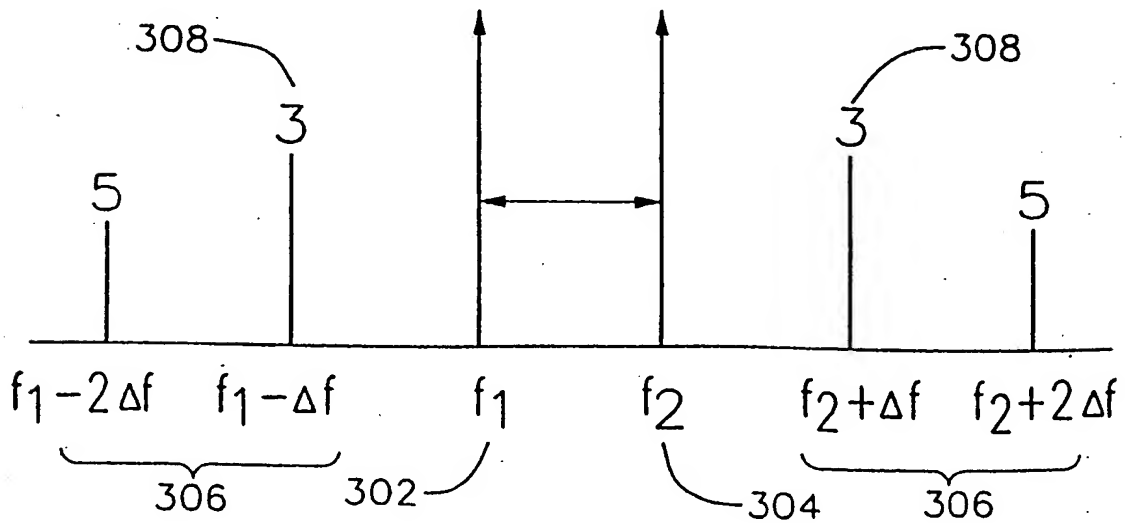
Appl. No. *To Be Assigned*; Filed: *Herewith*  
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*  
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

**FIG. 2**



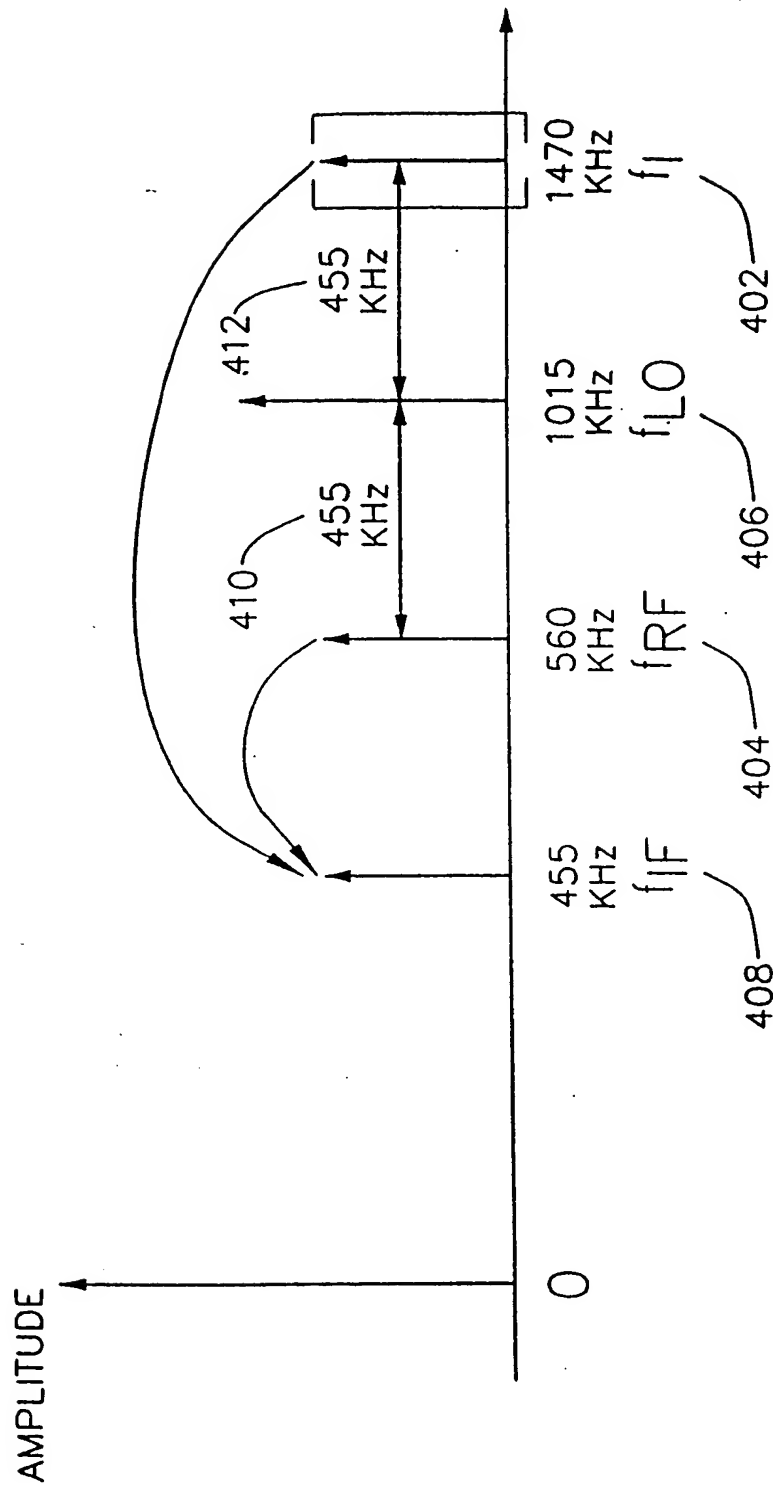
**FIG. 3**

PRIOR ART



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 Dkt. No. 1875.138000G; Group Art Unit: To Be Assigned  
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

**FIG. 4**  
PRIOR ART



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 Dkt. No. 1875.138000G; Group Art Unit: To Be Assigned  
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

**FIG. 5**  
 DUAL CONVERSION RECEIVER

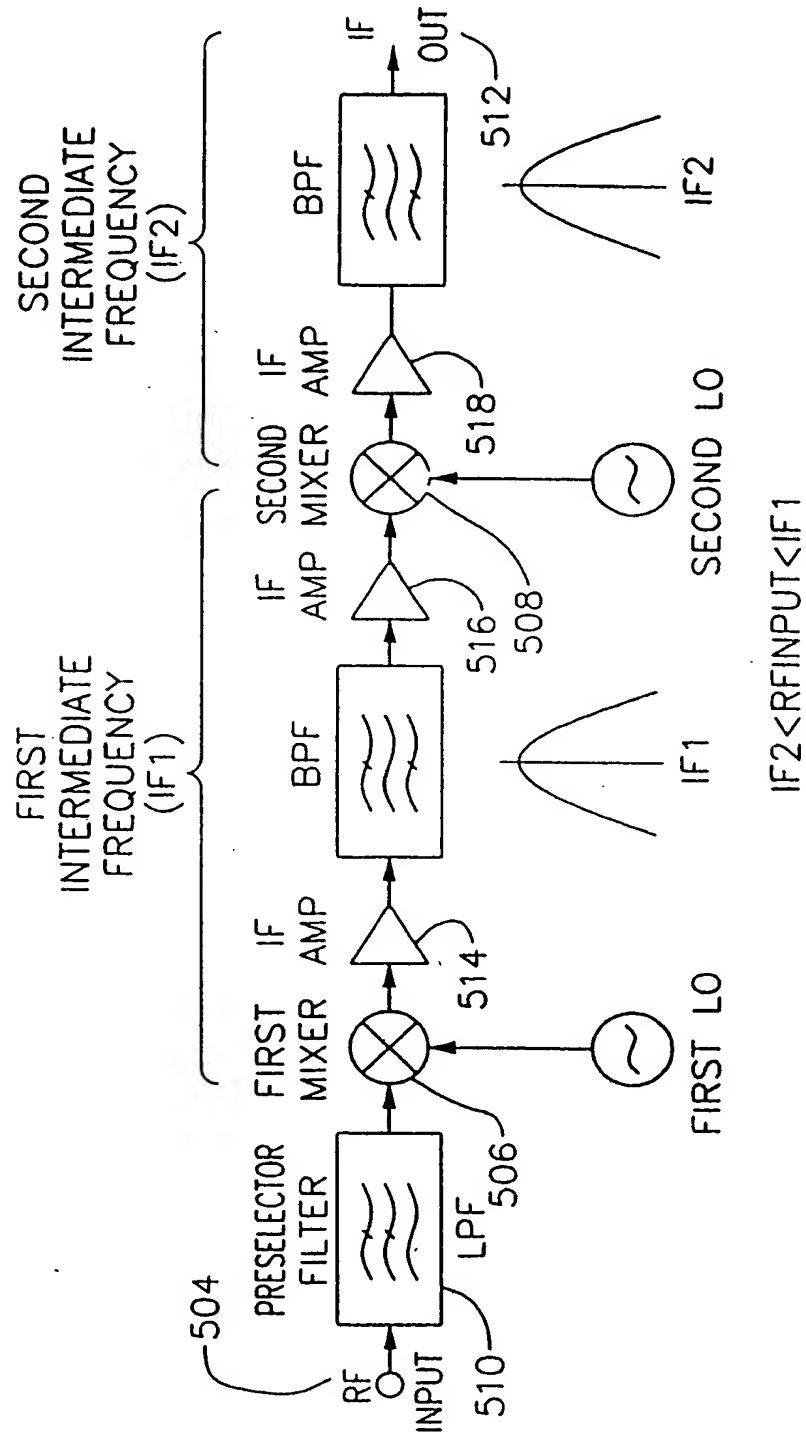


FIG. 6

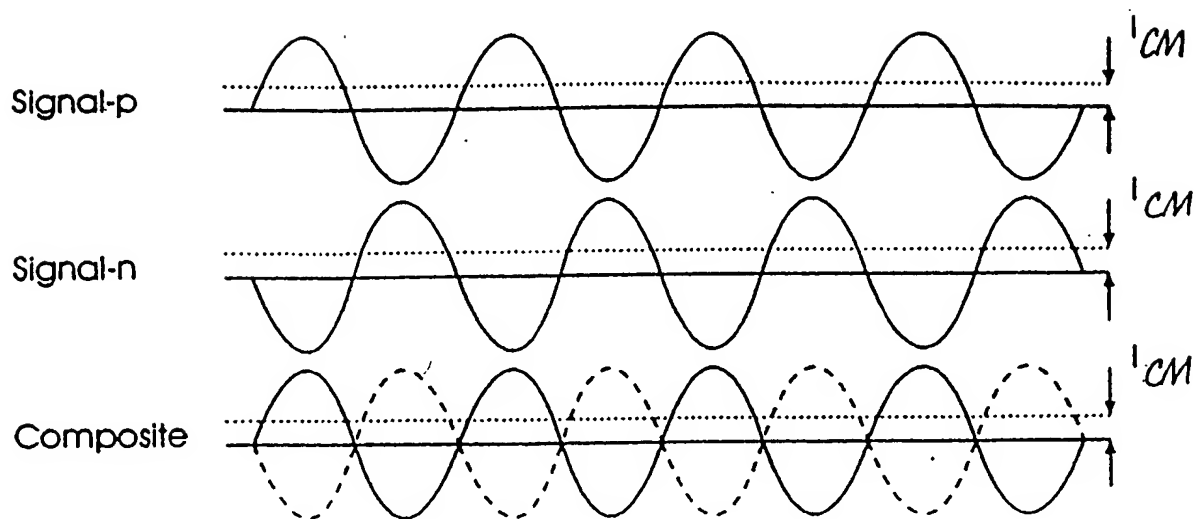
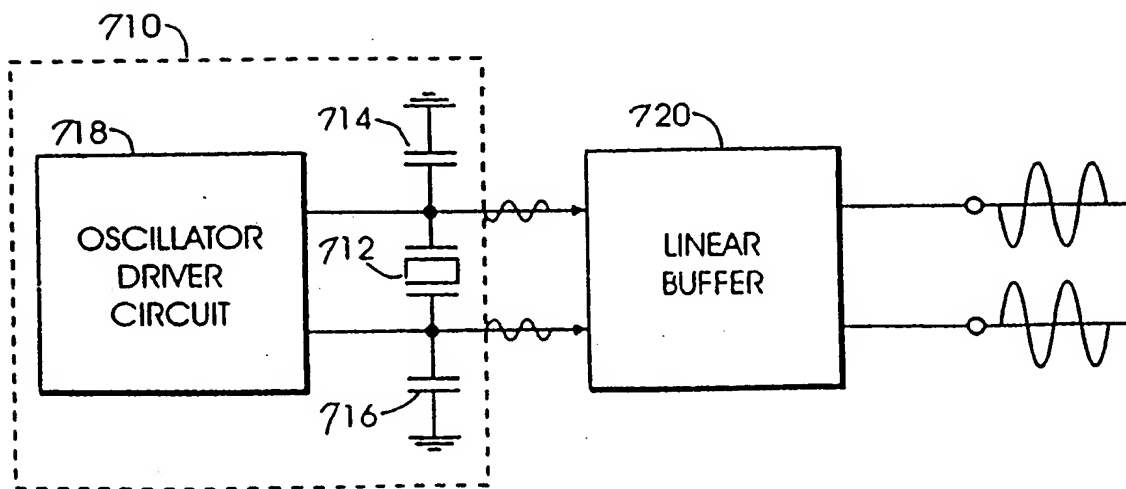
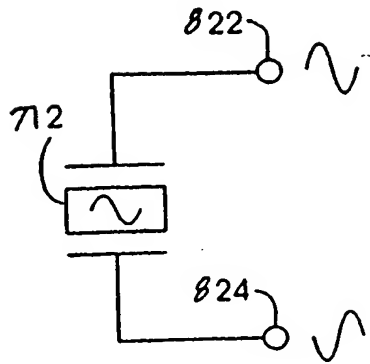


FIG. 7

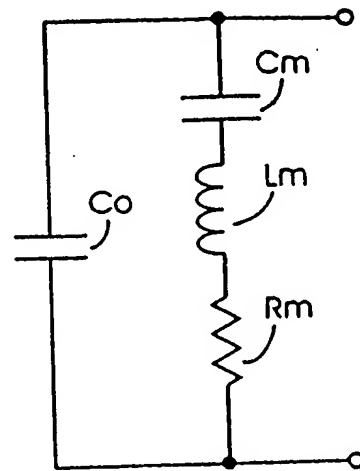


Appl. No. *To Be Assigned*; Filed: *Herewith*  
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*  
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

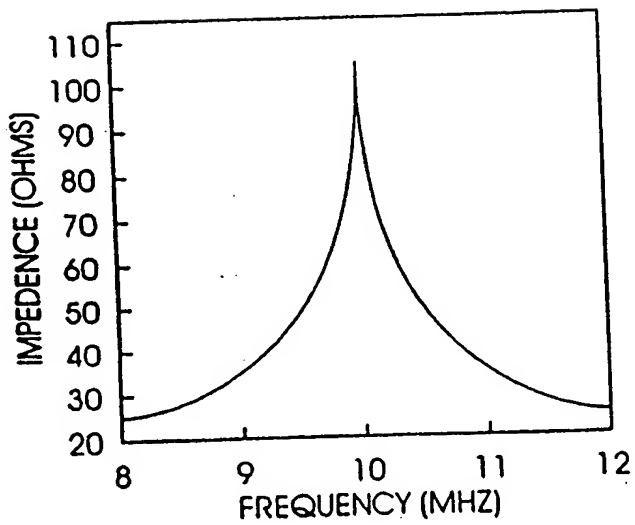
**FIG. 8**



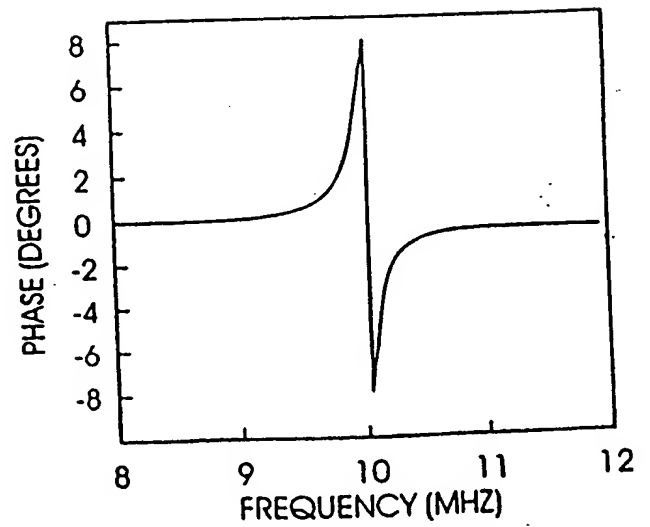
**FIG. 9**



**FIG. 10**



**FIG. 11**



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 VGA

FIG. 12

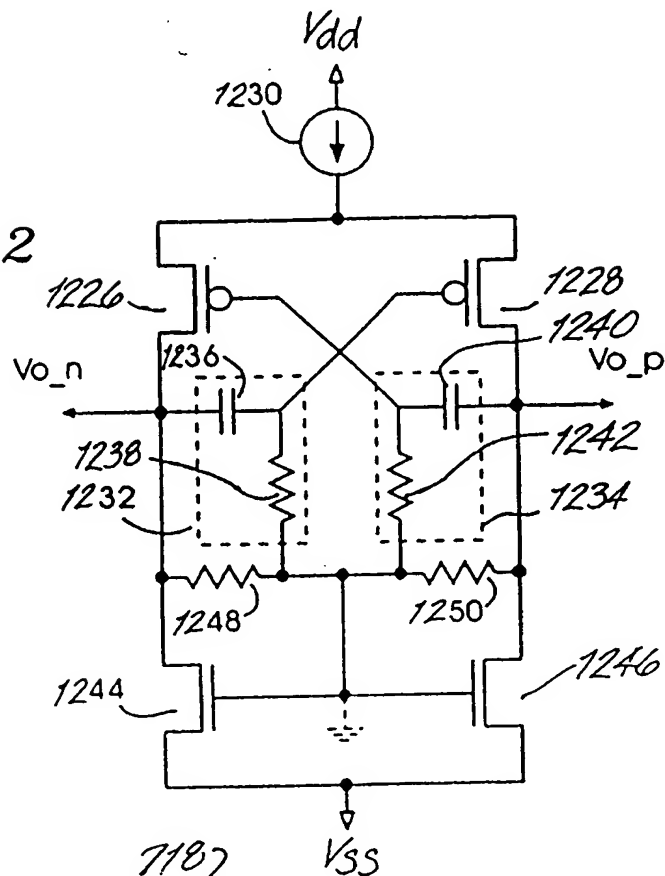


FIG. 13

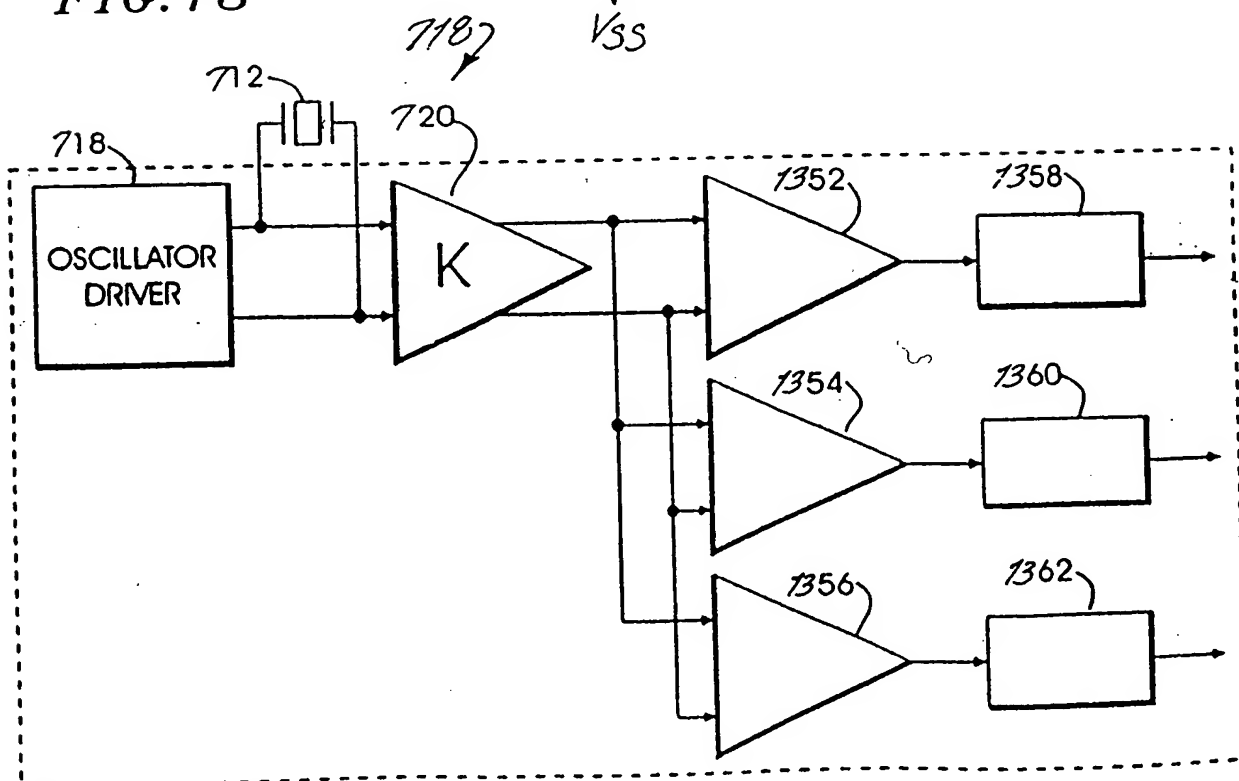
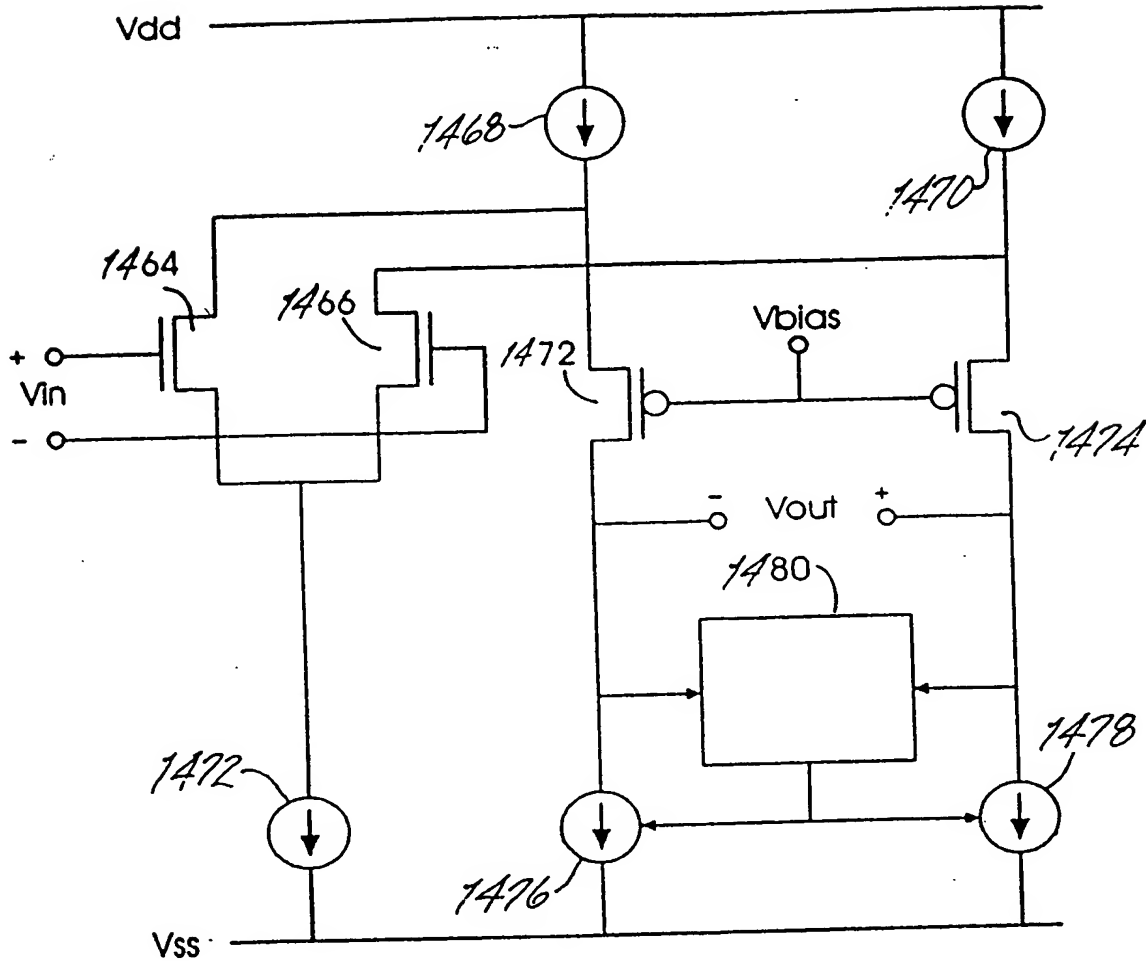


FIG. 14





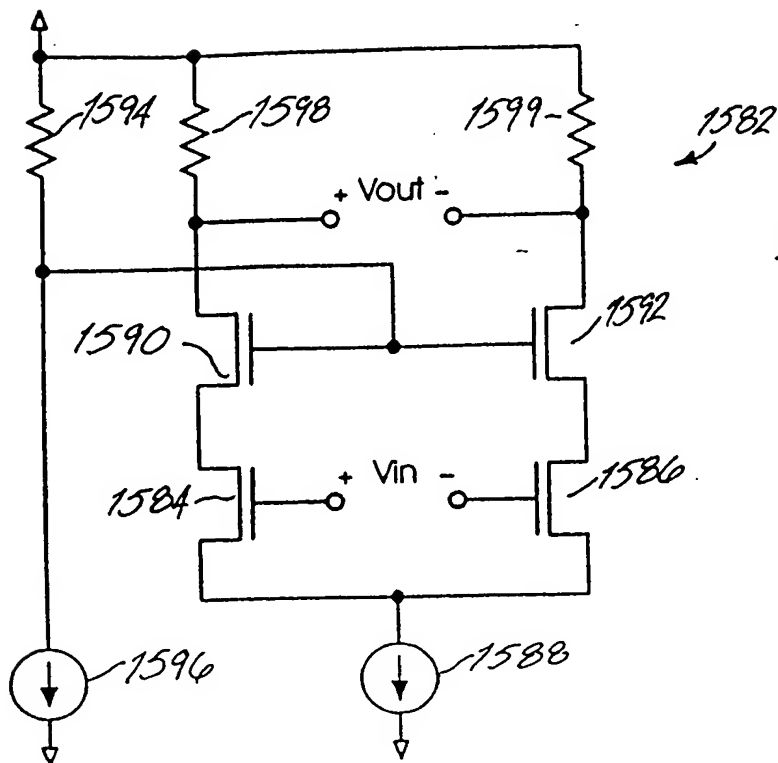
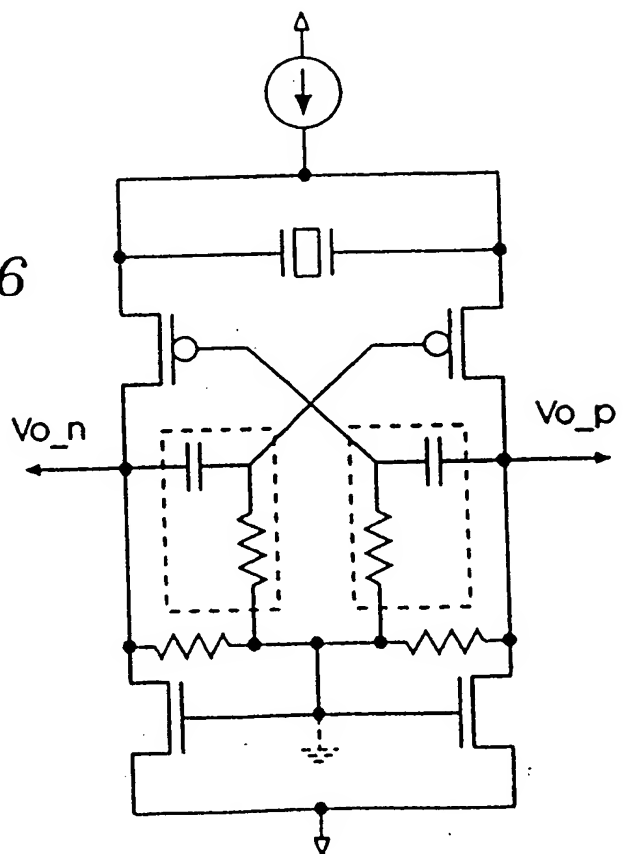


FIG. 15

FIG. 16



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 Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
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 VGA

FIG. 17

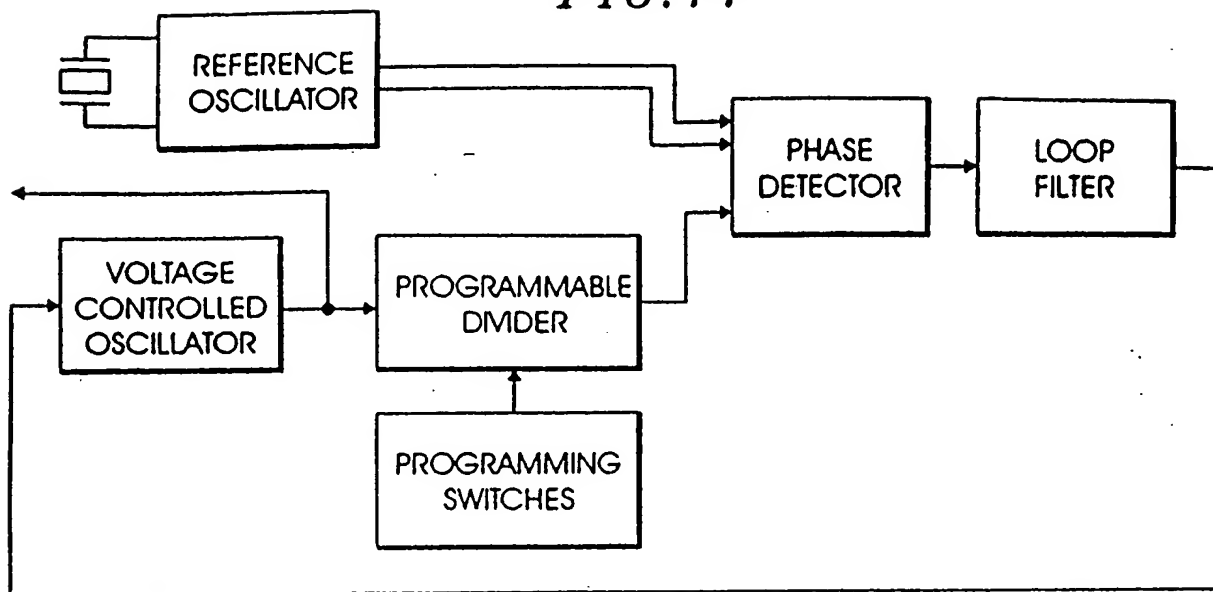
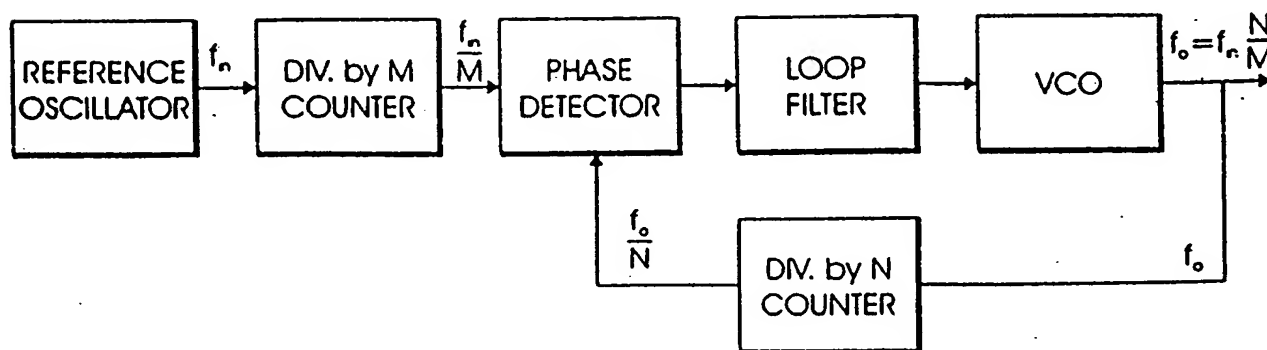
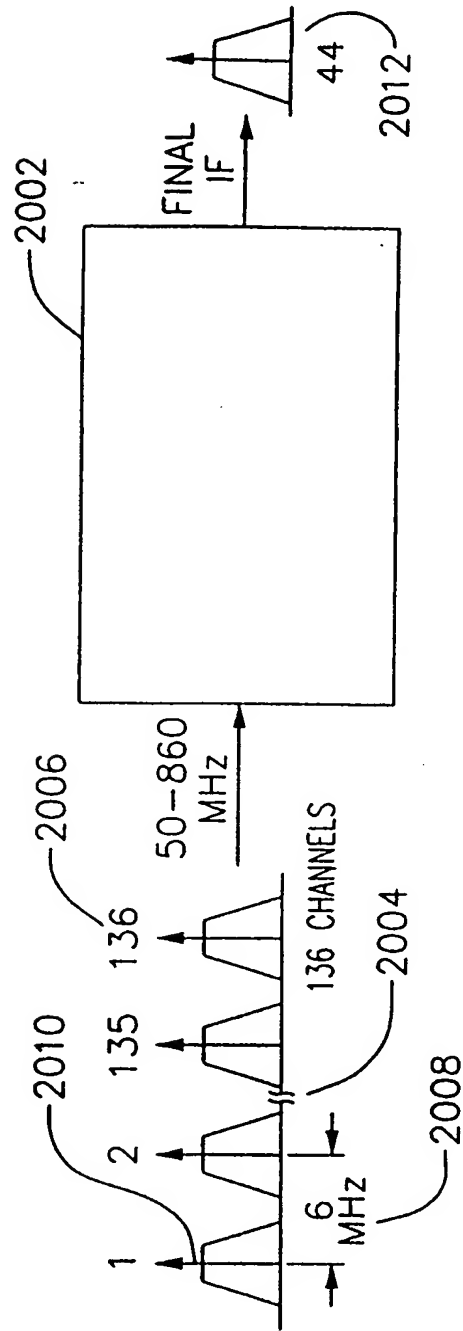


FIG. 18



[illegible]

FIG. 20



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 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

# FIG. 21

PPL Xtdl REFERENCE=10MHz  
 LO-1, 10MHz FREQUENCY STEPS  
 LO-2, 100kHz FREQUENCY STEPS

44MHz IF

NOTE  
 •LO-2 REF=100KHz,  
 SO DIVIDE RANGE=9216 TO 9280

TABLE OF FREQUENCIES BASED ON  
 COARSE/FINE PLL SOLUTION:

Fr1 (MHz)	50	56	62	68	74	80	86	92	98	104	110	116	122	128	"	854	860
LO-1(MHz)	1250	1260	1260	1270	1270	1280	1290	1290	1300	1300	1310	1320	1320	1330	"	2050	2060
IF-1 (MHz)	1200	1204	1198	1202	1196	1200	1204	1198	1202	1196	1200	1204	1198	1202	"	1196	1200
LO-2(MHz)	924.8	928.0	923.2	926.4	921.6	924.8	928.0	923.2	926.4	921.6	924.8	928.0	923.2	926.4	"	921.6	924.8
IF-2(MHz)	275.2	276.0	274.8	275.6	274.4	275.2	276.0	274.8	275.6	274.4	275.2	276.0	274.8	275.6	"	274.4	275.2
LO-3(MHz)	231.2	232	230.8	232	230	231	232	231	232	230	231	232	231	232	"	230	231
IF-3(MHz)	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0	"	44.0	44.0

2102

Appl. No. To Be Assigned; Filed: Herewith  
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 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

# FIG. 22

36MHz IF

PPL Xtol REFERENCE=10MHz  
 LO-1, 10MHz FREQUENCY STEPS  
 LO-2, 100kHz FREQUENCY STEPS

## NOTE

• LO-2 REF=100KHz.  
 SO DIVIDE RANGE=9280 TO 9340

TABLE OF FREQUENCIES BASED ON  
 COARSE/FINE PLL SOLUTION:

Frf (MHz)	50	58	66	74	82	90	98	106	114	122	130	138	146	154	"	852	860
LO-1(MHz)	1250	1260	1270	1270	1280	1290	1300	1310	1310	1320	1330	1340	1350	1350	"	2050	2060
IF-1 (MHz)	1200	1202	1204	1196	1198	1200	1202	1204	1196	1198	1200	1202	1204	1196	"	1198	1200
LO-2(MHz)	931.2	932.8	934.4	928.0	930	931	933	934	928.0	930	931	933	934	928.0	"	929.60	931.2
IF-2(MHz)	268.8	269.2	269.6	268.0	268.4	268.8	269.2	269.6	268.0	268.4	268.8	269.2	269.6	268.0	"	268.4	268.8
LO-3(MHz)	232.8	233.2	233.6	232	232	233	233	234	232	232	233	233	234	232.0	"	232.4	232.8
IF-3(MHz)	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	"	36.0	36.0

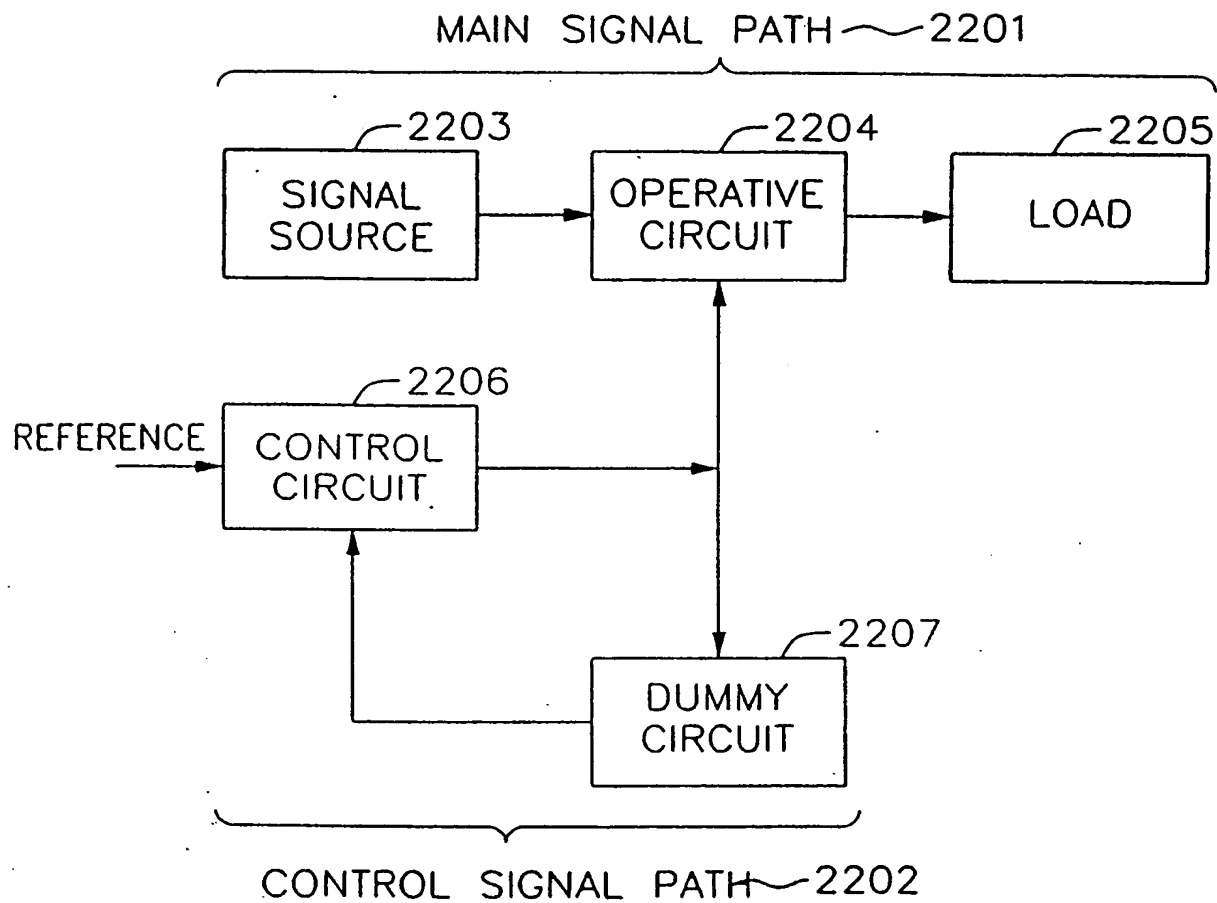
**FIG. 23**

FIG. 24a

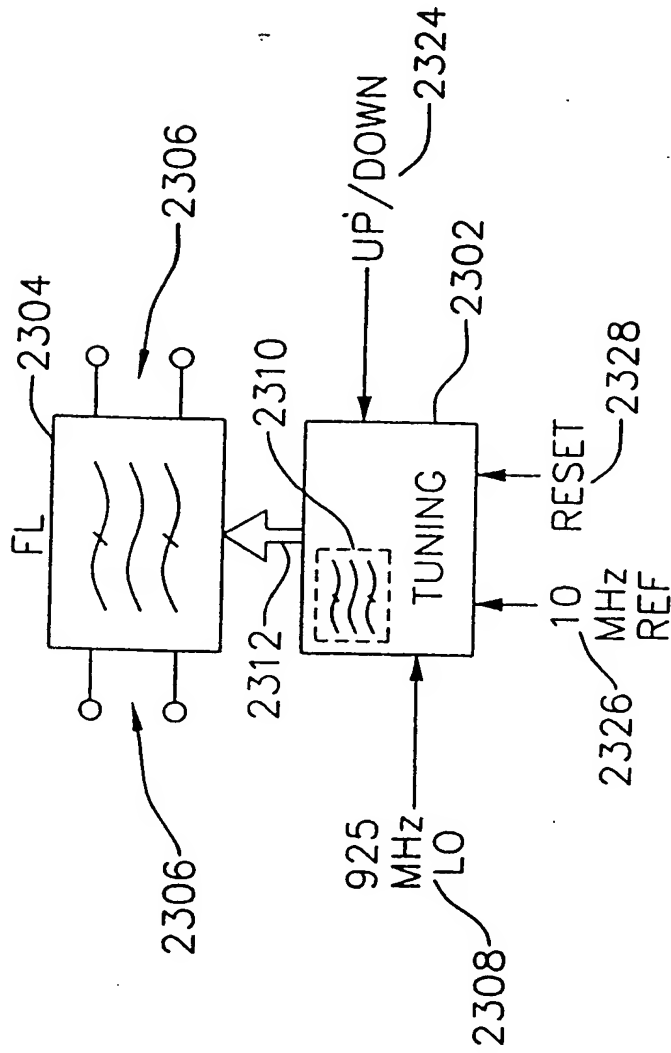
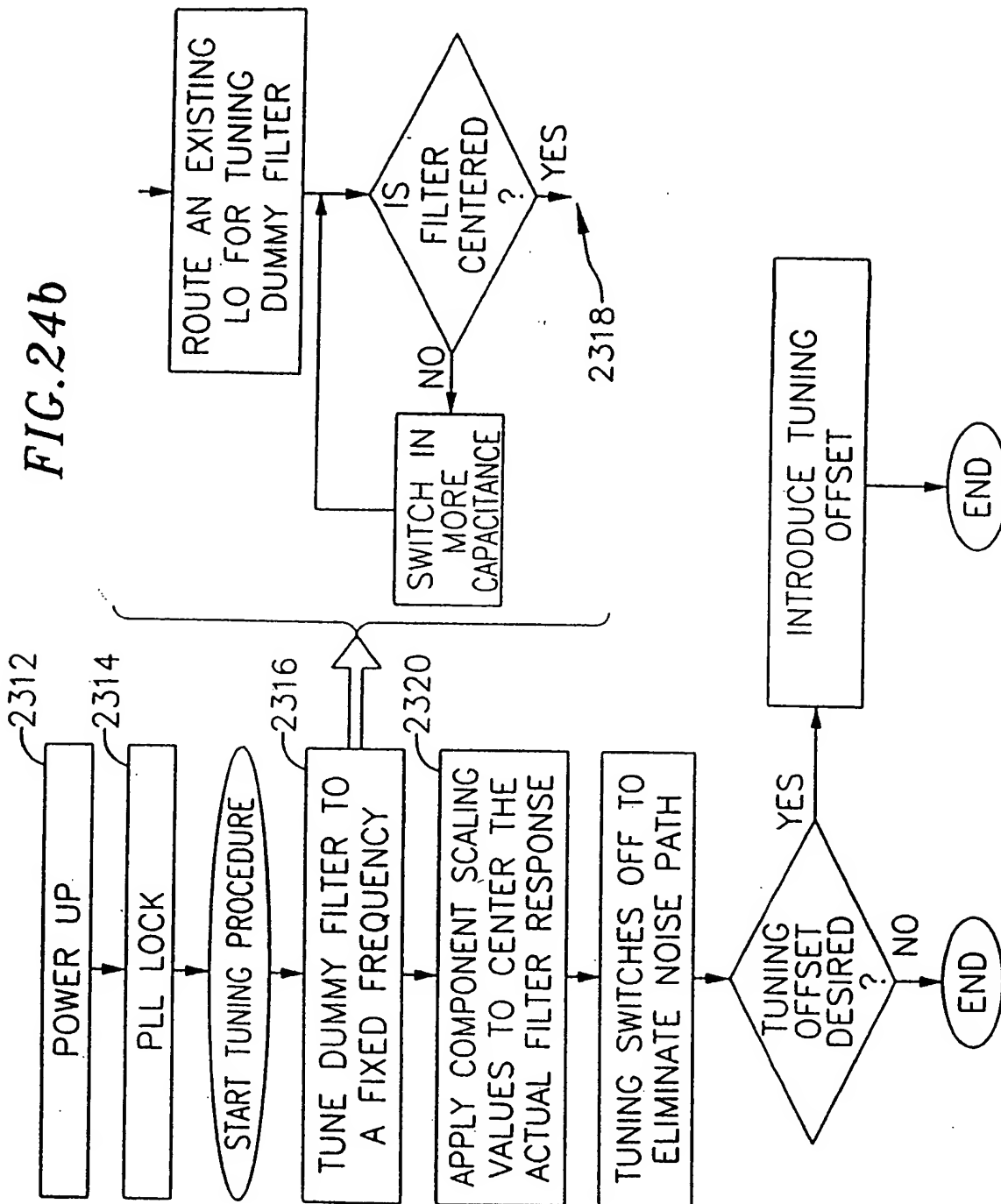




FIG. 24b



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 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

FIG. 24c

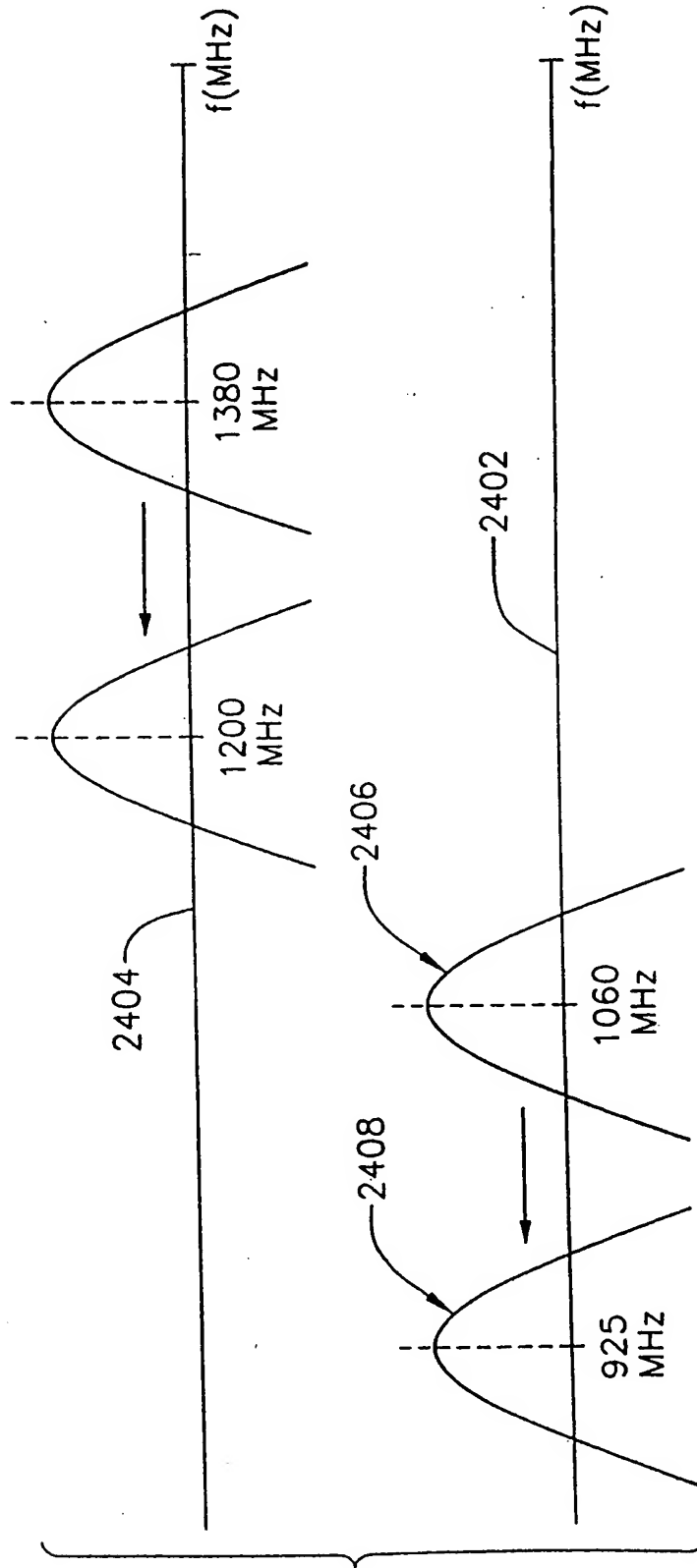
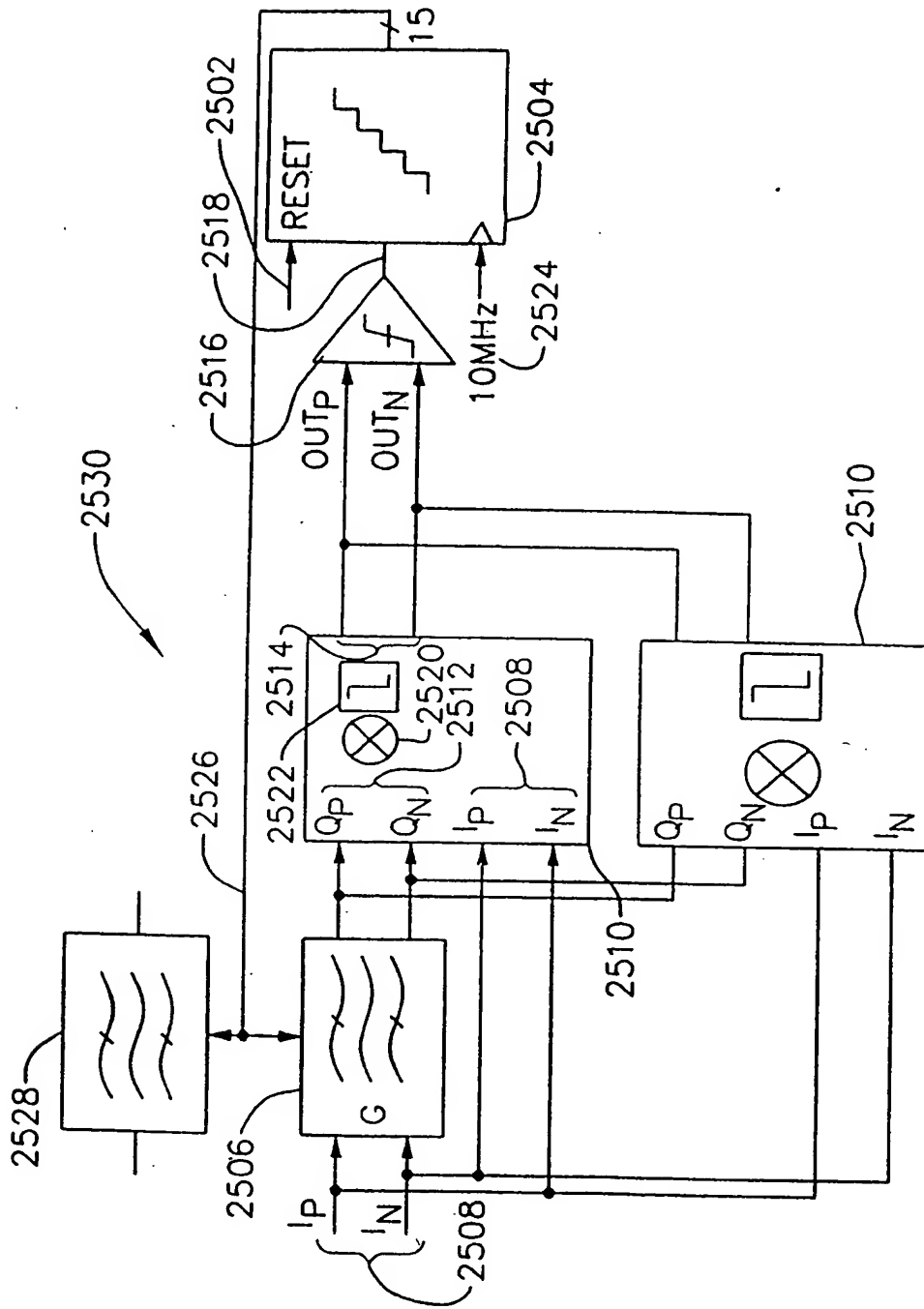
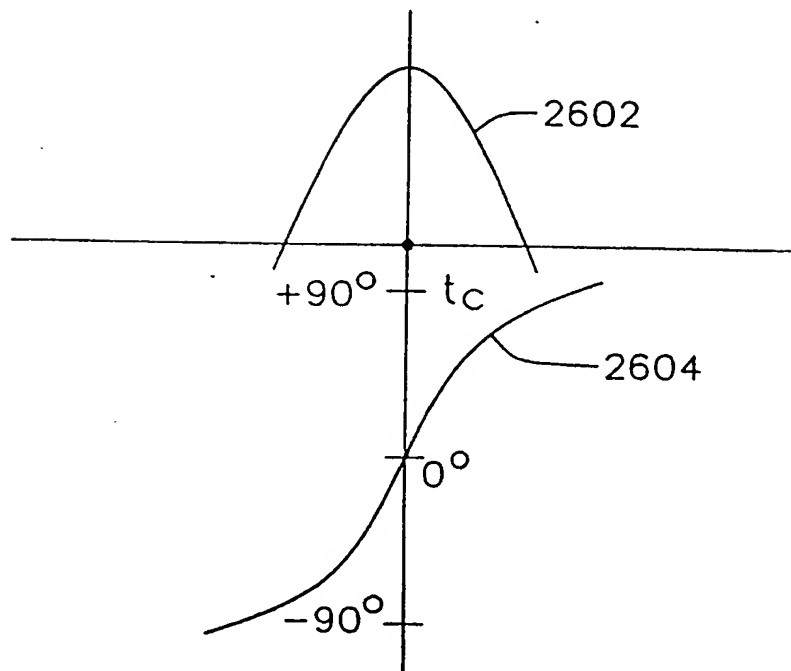
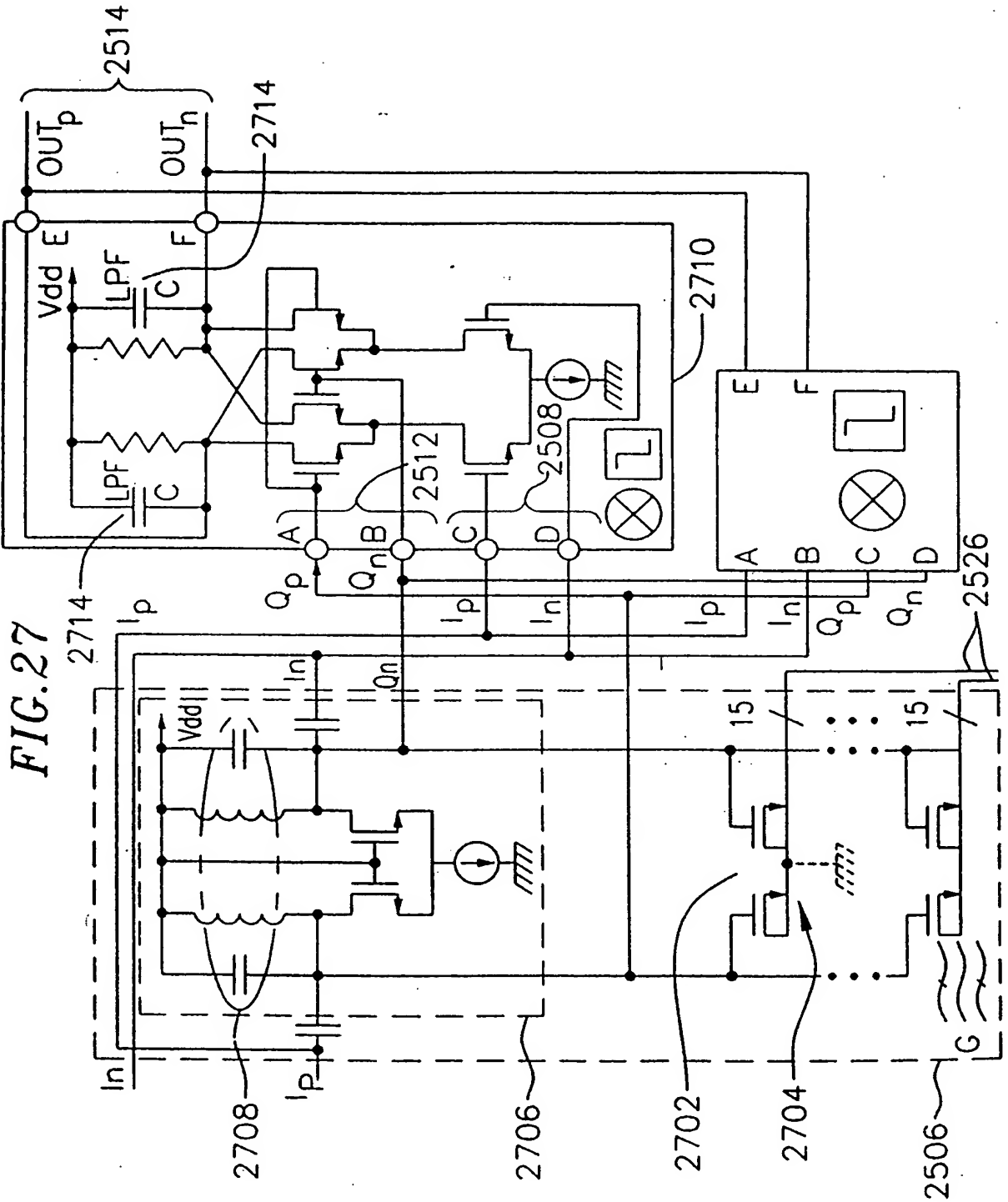


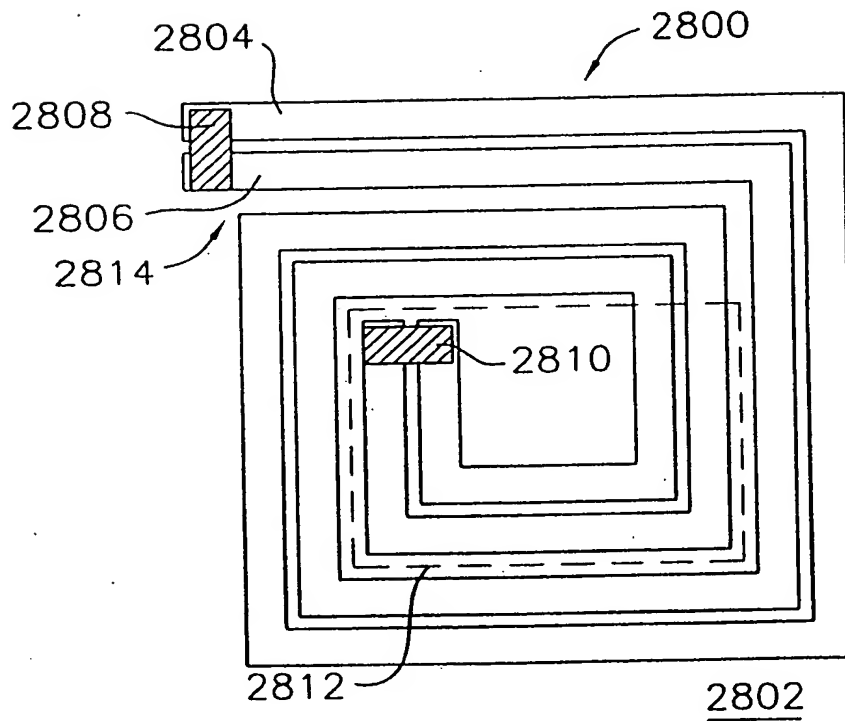
FIG. 25



**FIG. 26**



**FIG. 28a**



**FIG. 28b**

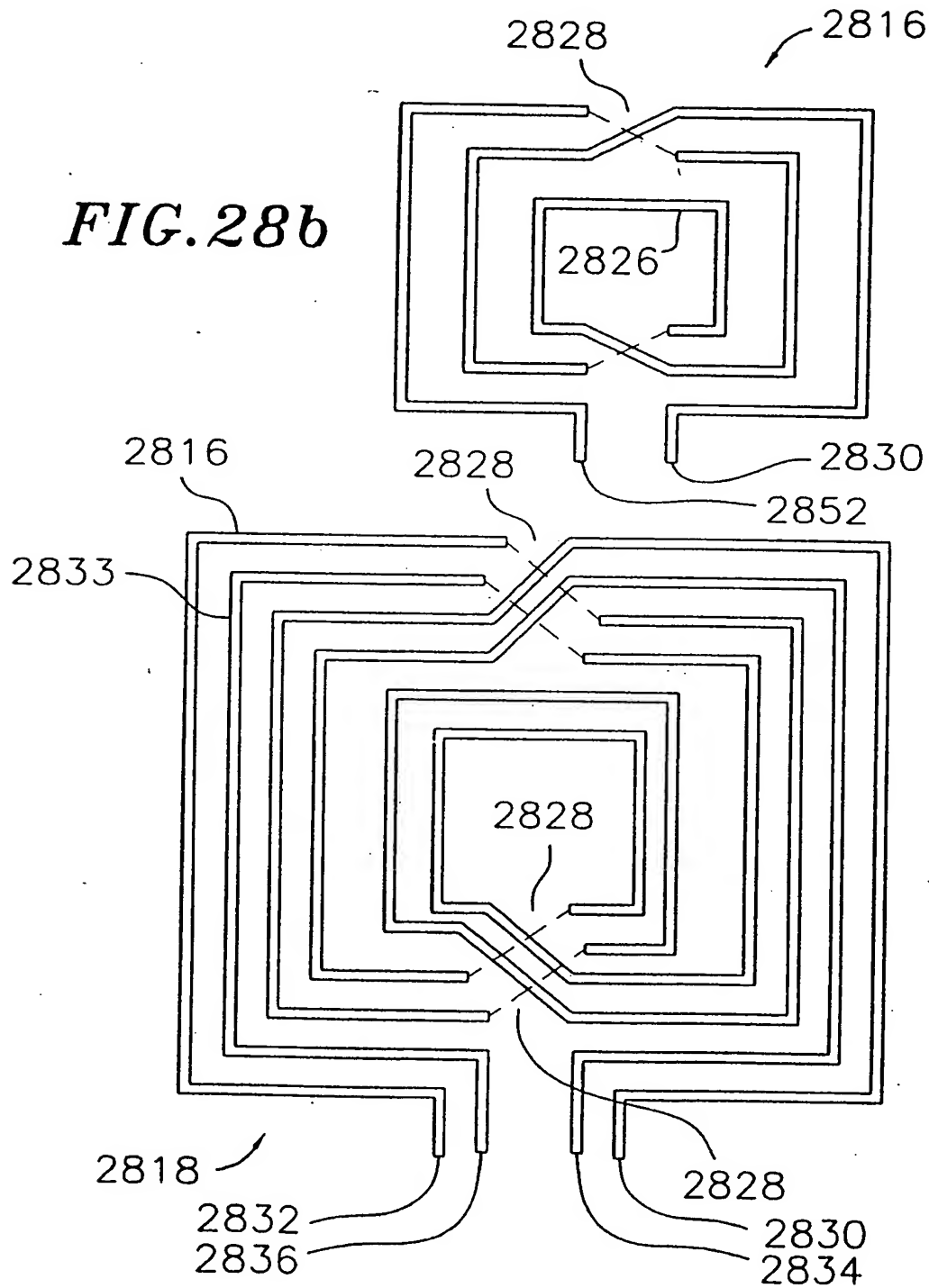


FIG. 28c

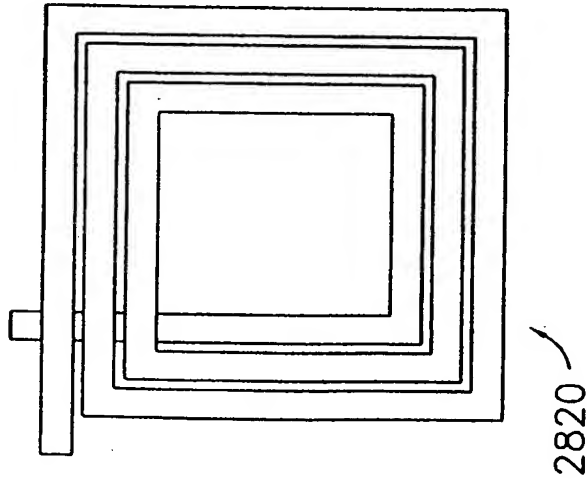


FIG. 28d

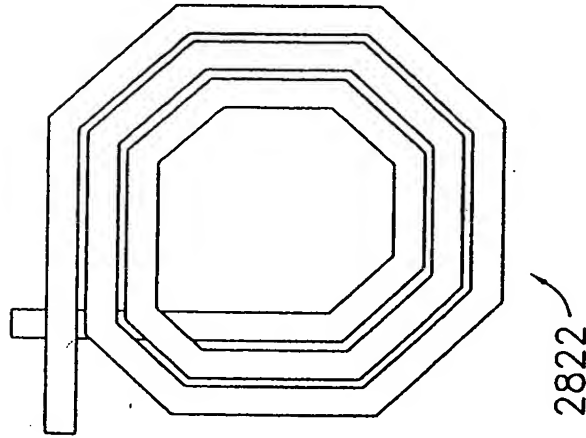
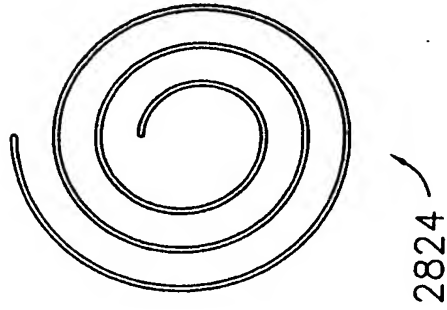
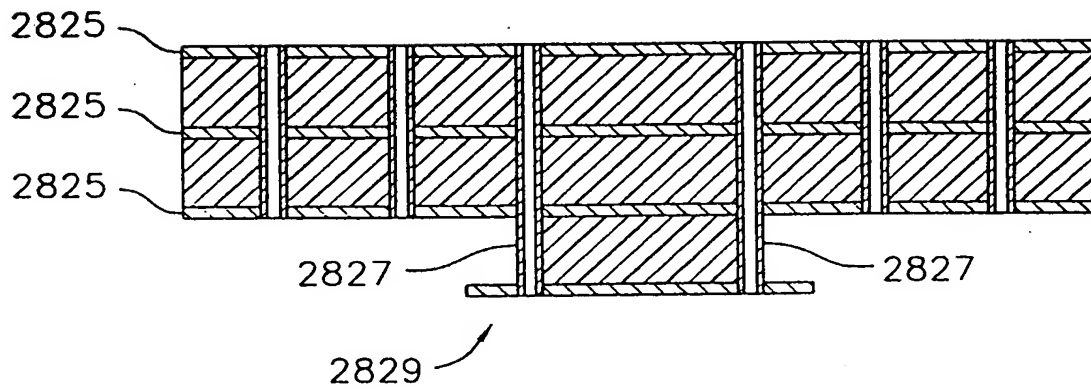


FIG. 28e

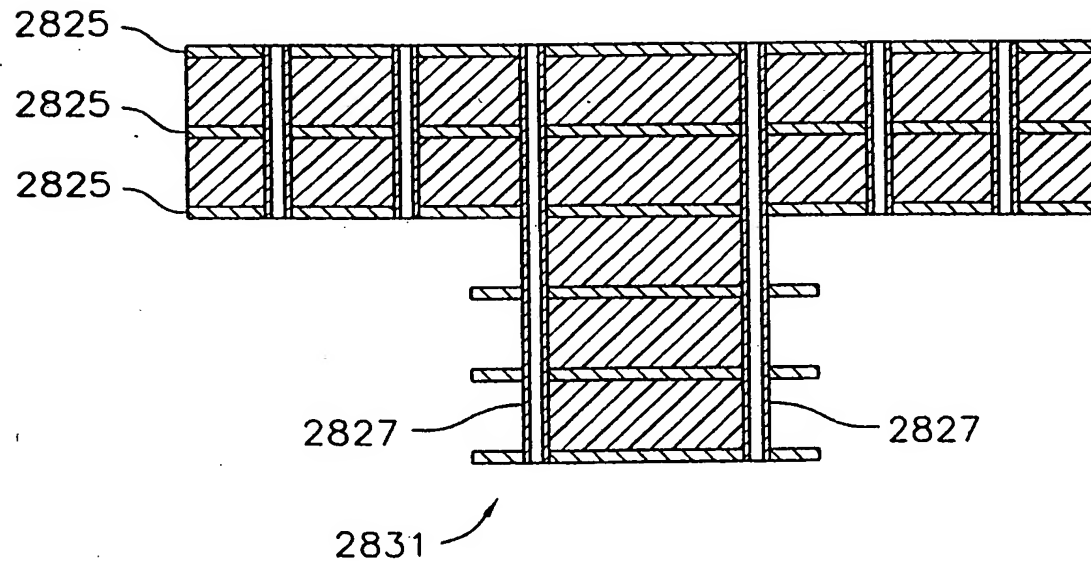




**FIG.28f**

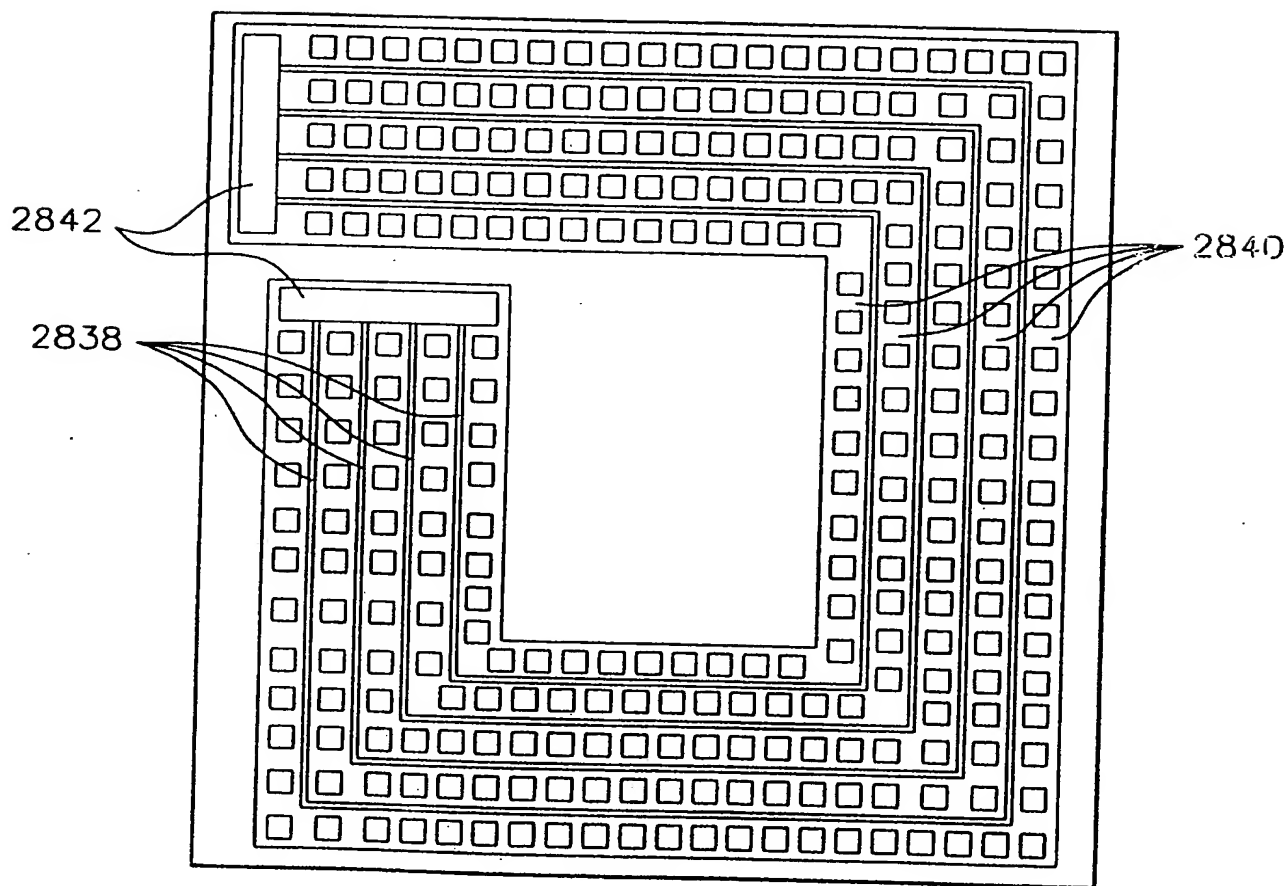


**FIG.28g**

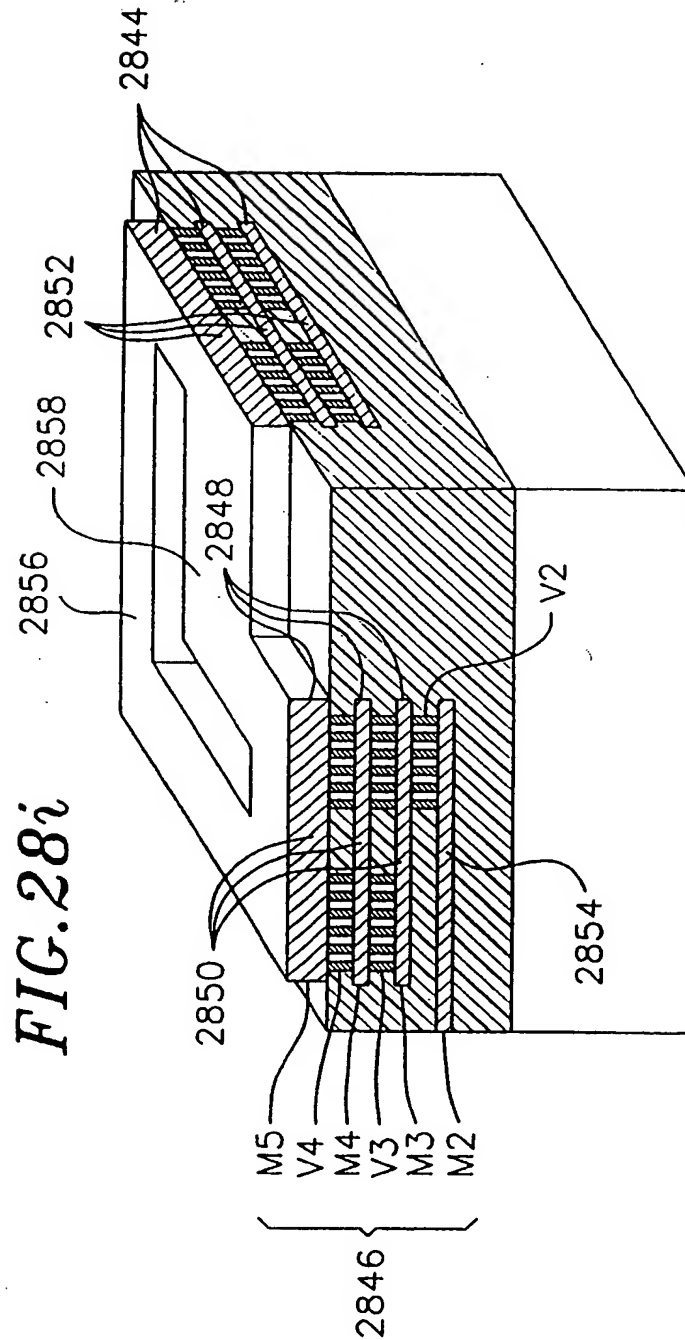


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 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*  
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

**FIG.28h**

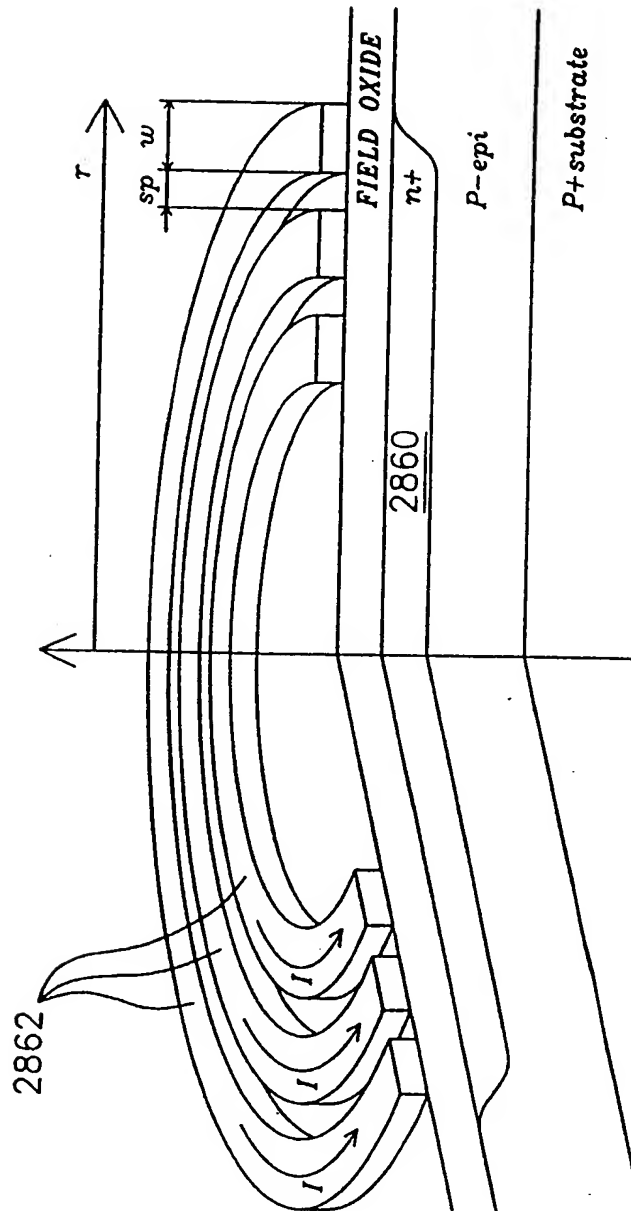


Appl. No. *To Be Assigned*; Filed: *Herewith*  
 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*  
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA



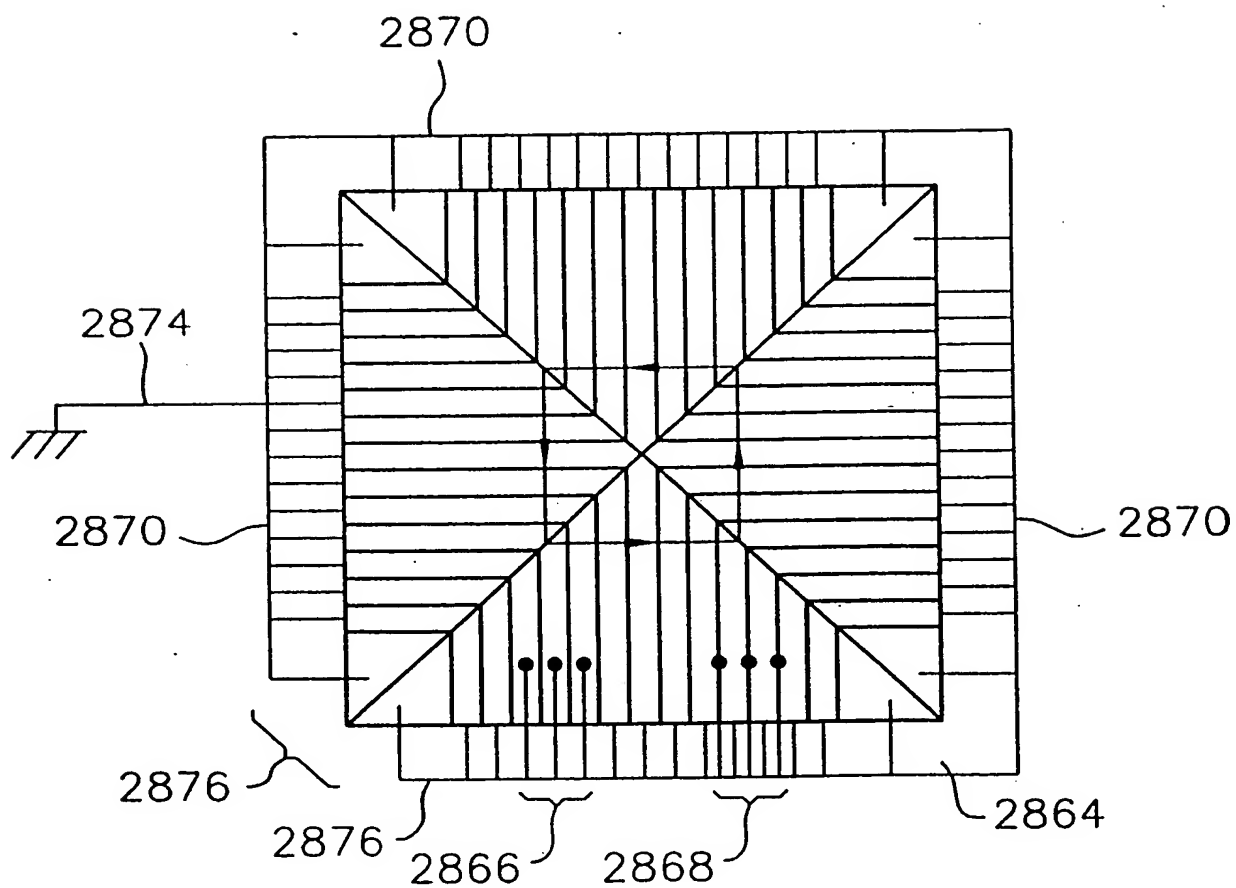
Appl. No. *To Be Assigned*; Filed: *Herewith*  
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*  
Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
Title: Large Gain Range, High Linearity, Low Noise MOS  
VGA

FIG. 28j



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 Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*  
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

**FIG. 28k**



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Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*  
Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
Title: Large Gain Range, High Linearity, Low Noise MOS  
VGA

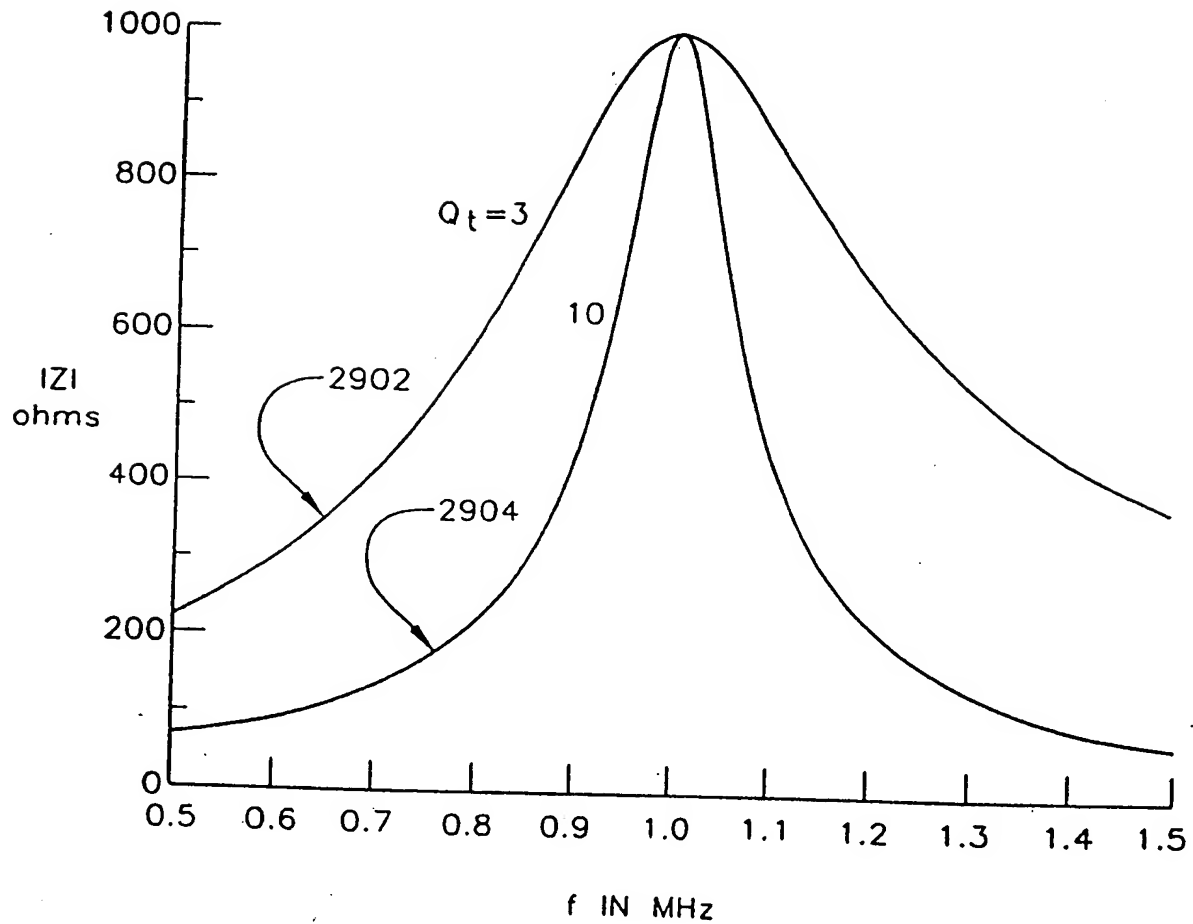
**FIG. 29**

FIG. 30

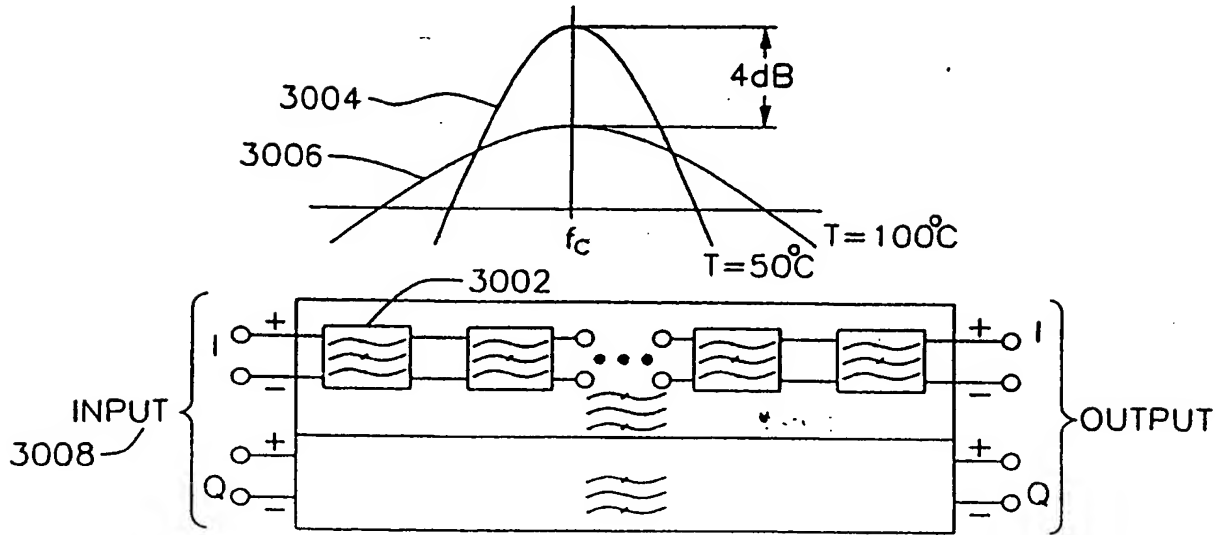


FIG. 31

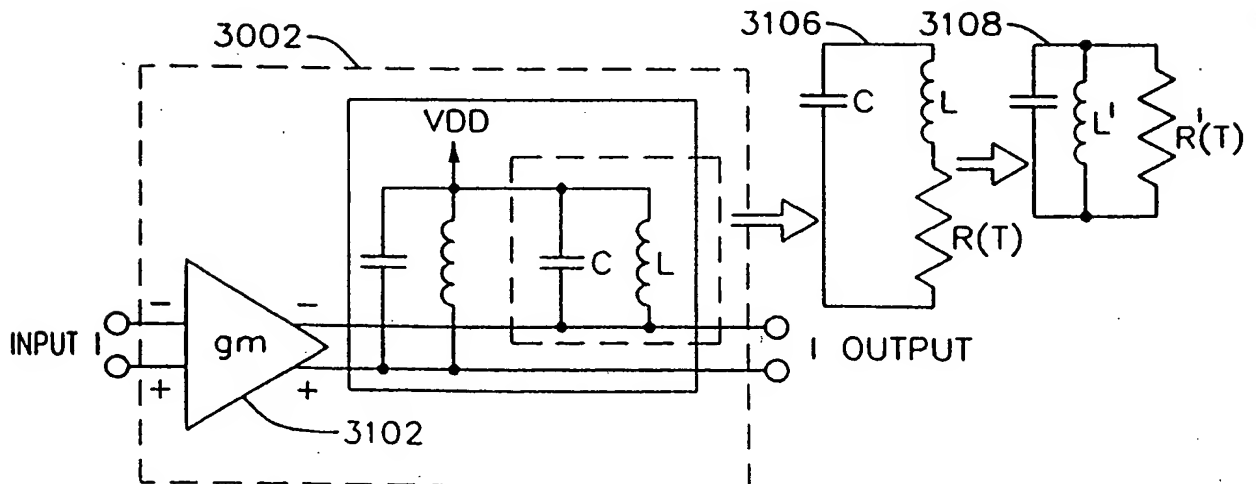


FIG. 32

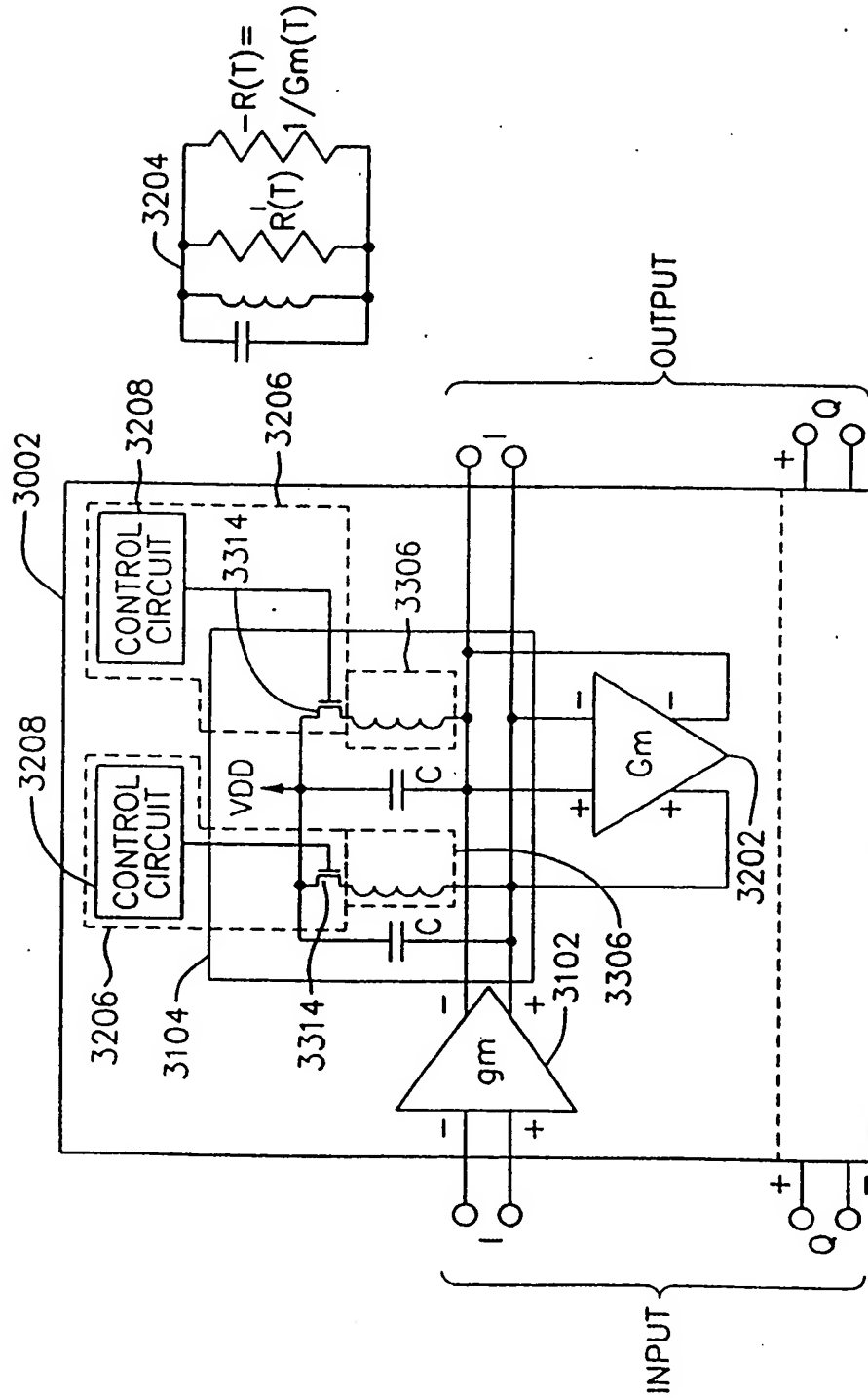
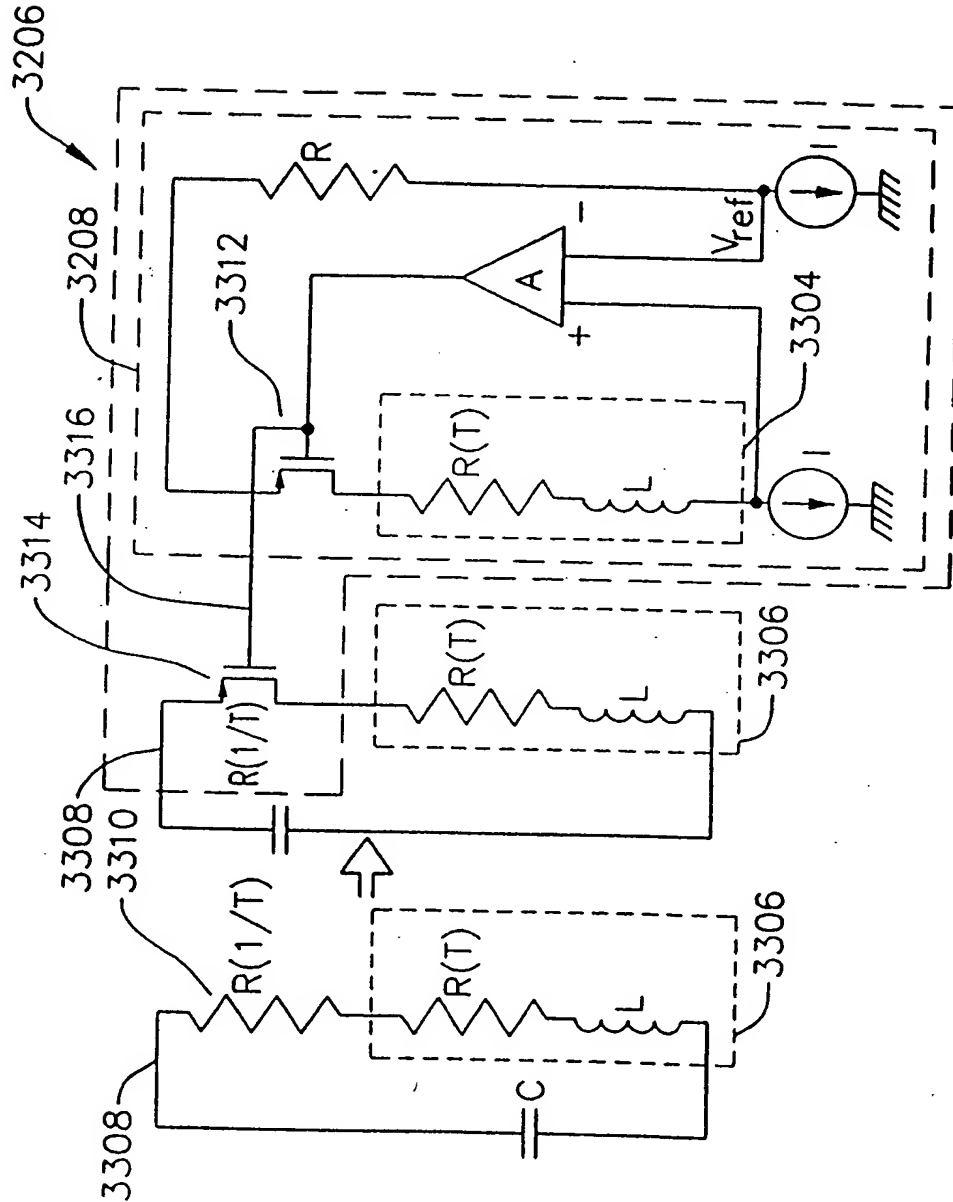




FIG. 33



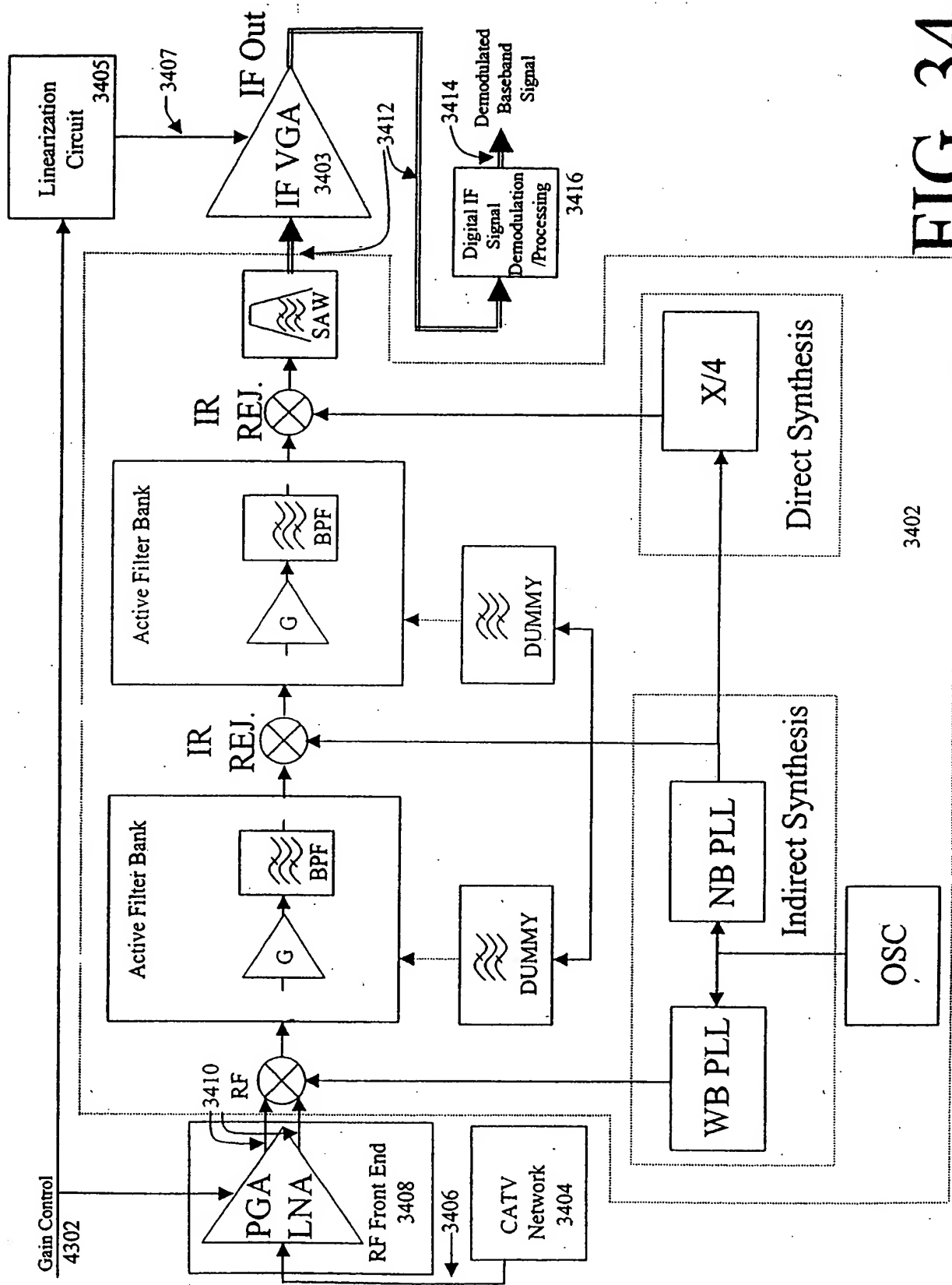
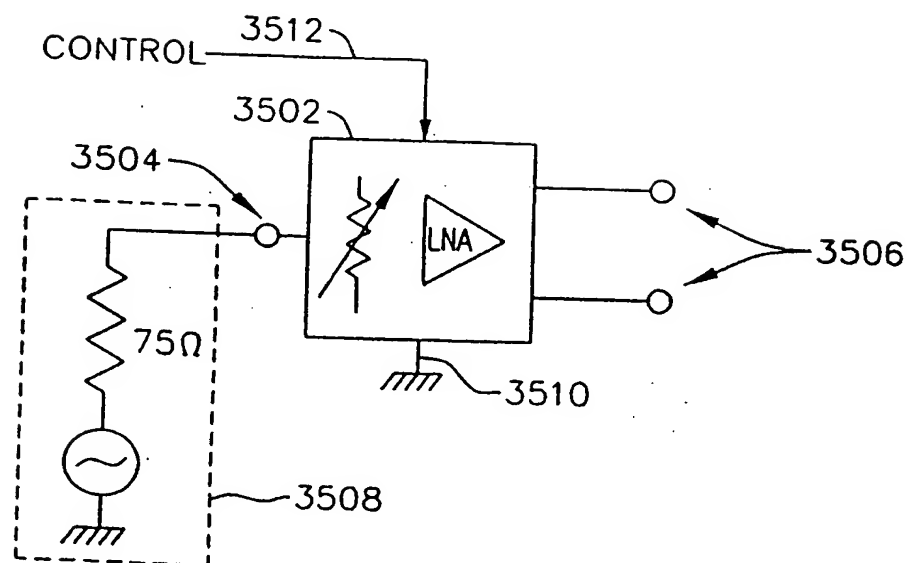


FIG. 34

Appl. No. *To Be Assigned*; Filed: *Herewith*  
Dkt. No. 1875.138000G; Group Art Unit: *To Be Assigned*  
Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
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VGA

**FIG. 35**

The diagram shows a multi-bit DAC circuit (3601) with a feedback loop (3603). The circuit includes a current source array (3605) with multiple current sources (3605<sub>0</sub>, 3605<sub>1</sub>, etc.) and a feedback loop (3603) that includes a resistor (3602) and a current source (3605<sub>0</sub>). The circuit is connected to a Vdd supply and an input (INPUT).

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 Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

FIG. 37

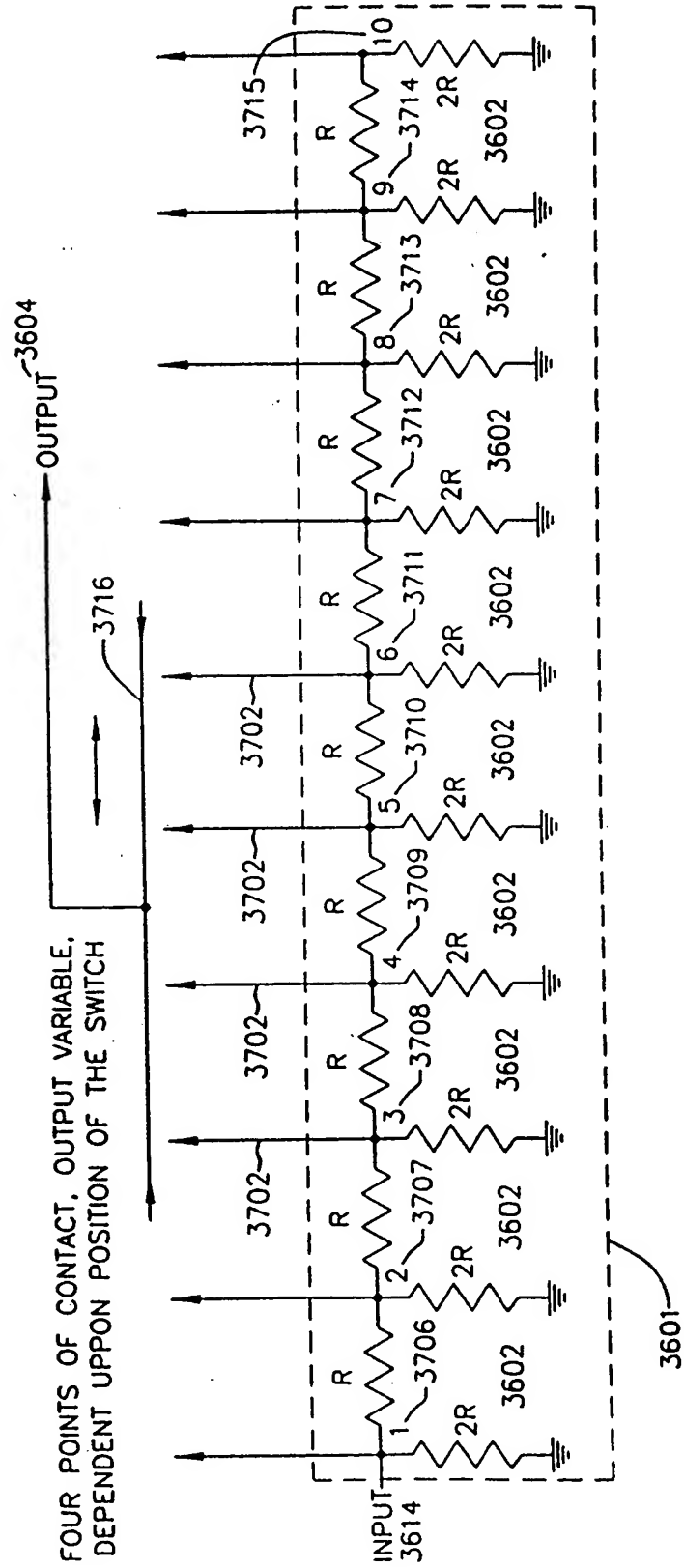


FIG. 38

PGA SETTINGS

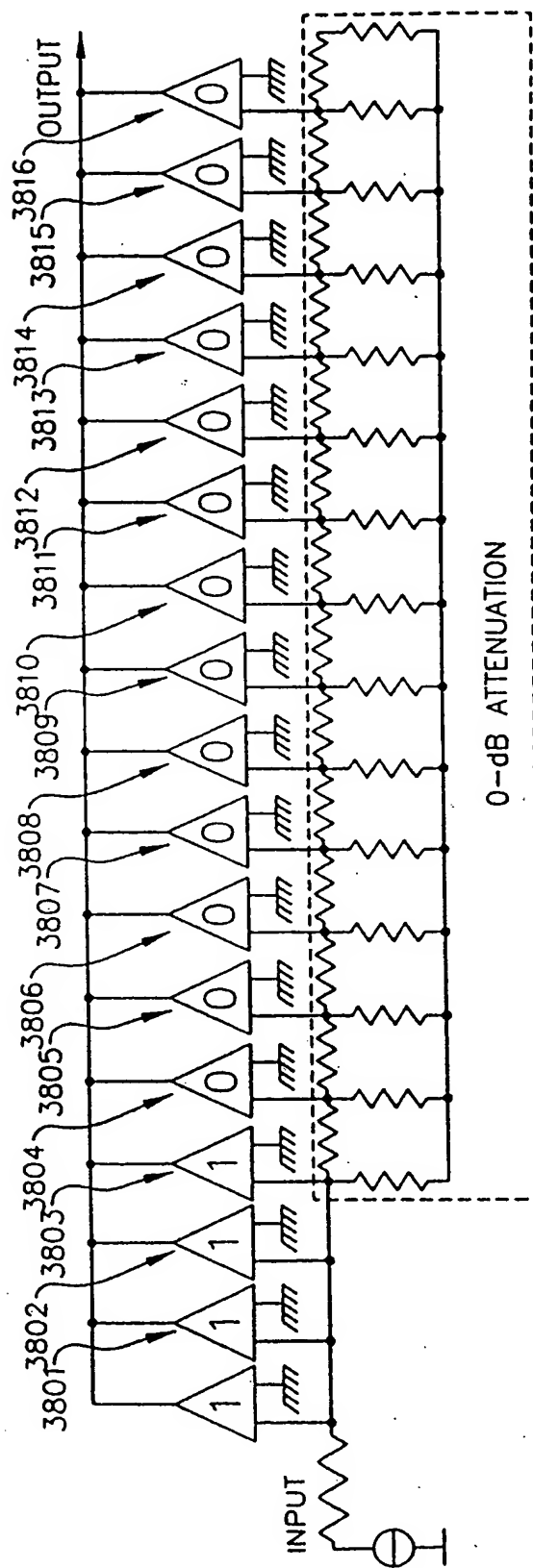


FIG. 39

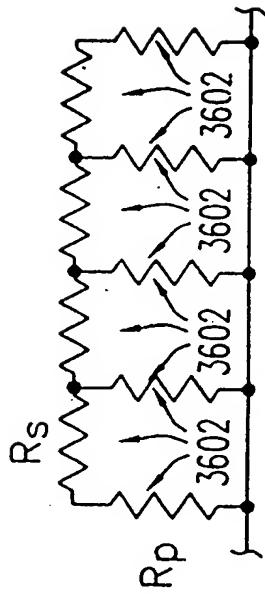
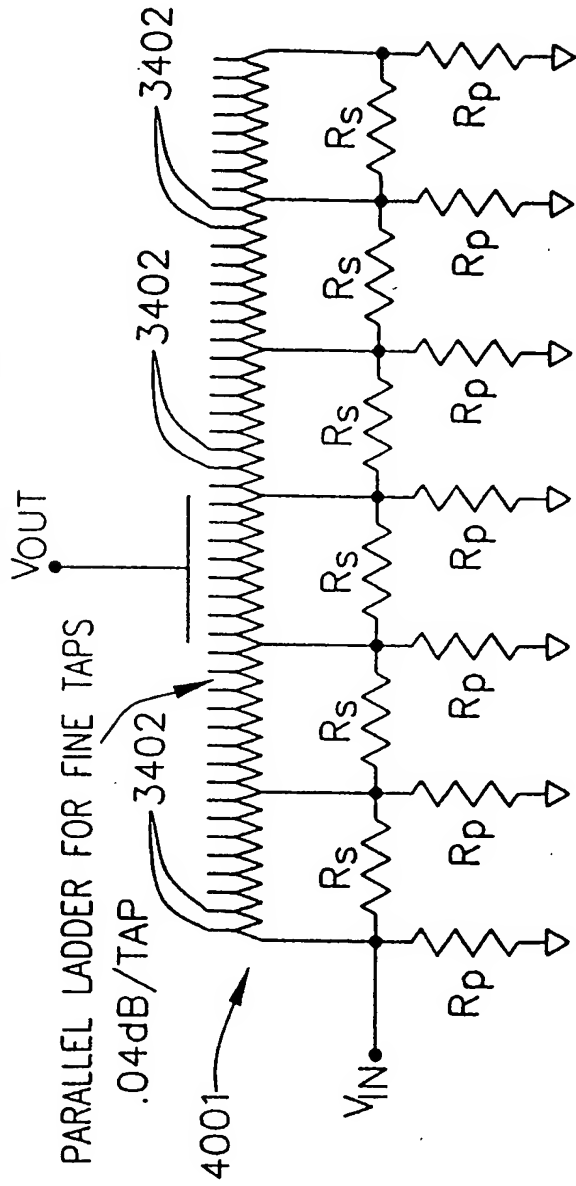


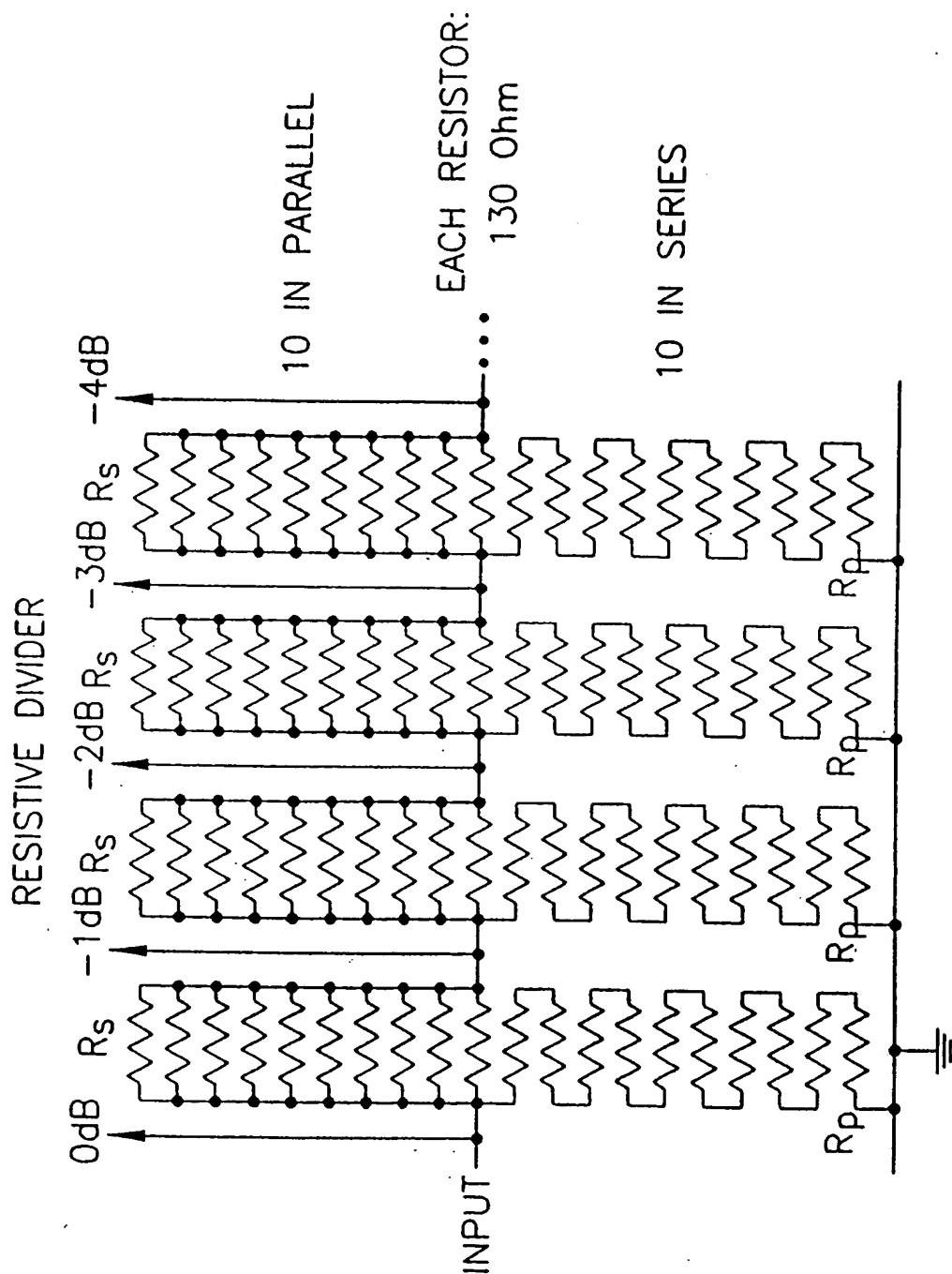
FIG. 40

PGA ARCHITECTURE



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 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

FIG. 41

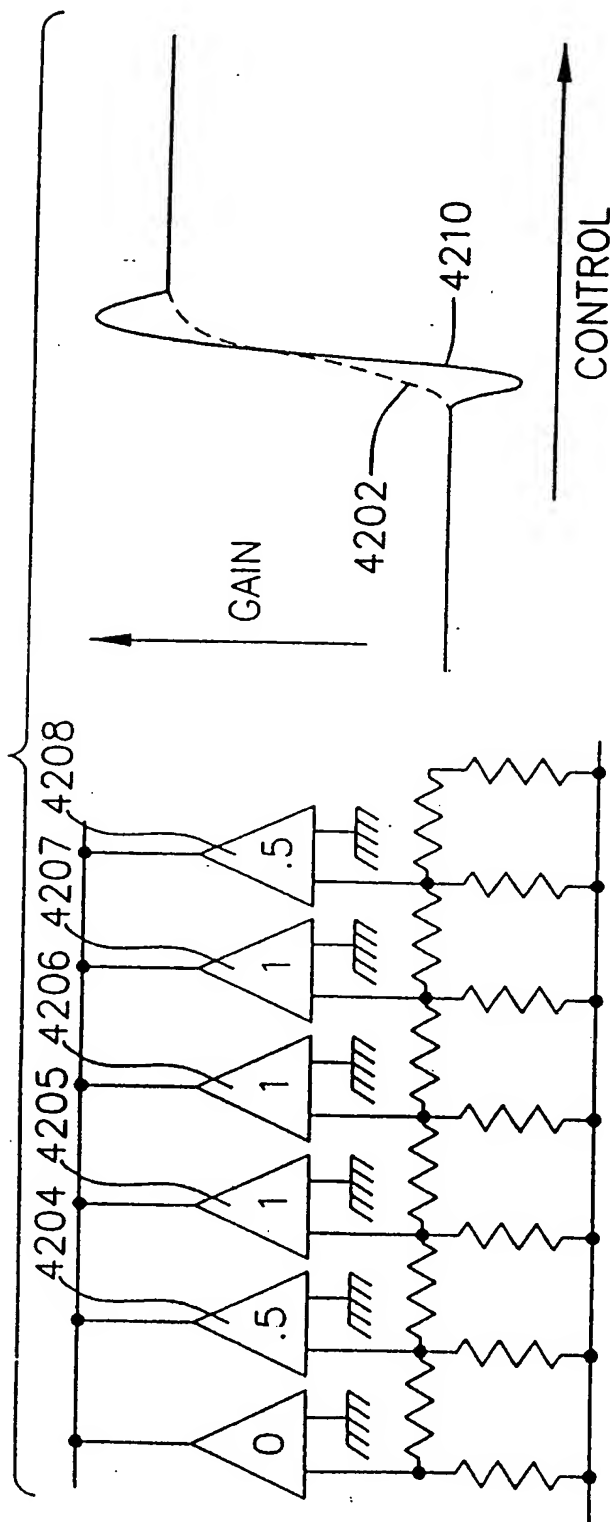




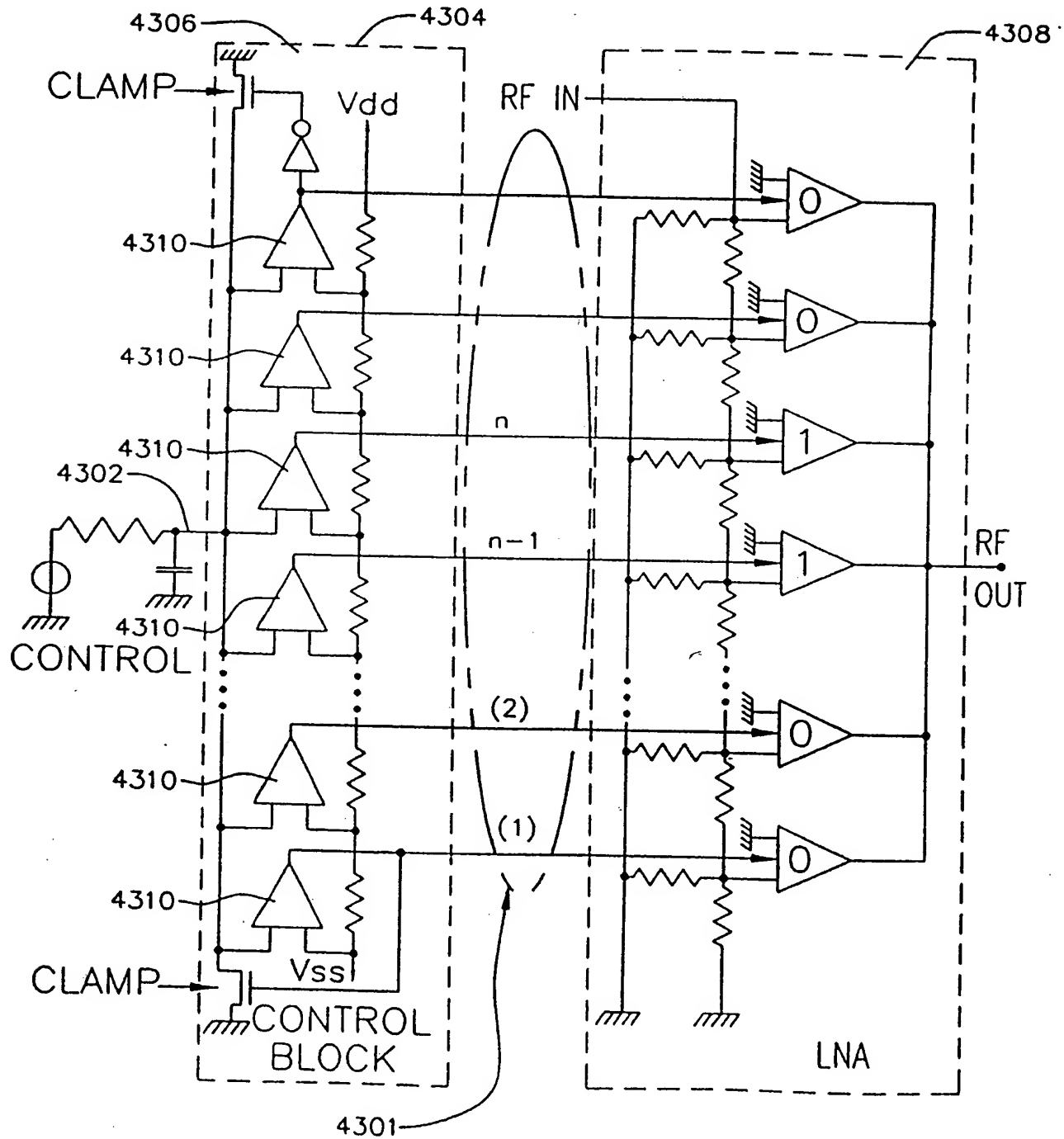
Appl. No. To Be Assigned; Filed: Herewith  
 Dkt. No. 1875.138000G; Group Art Unit: To Be Assigned  
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

FIG. 42

NON-MONOTONICITY



**FIG. 43**  
 CLAMPING CONTROL RANGE



**FIG. 44a**  
 CONTROLLED GAIN COMPARATOR

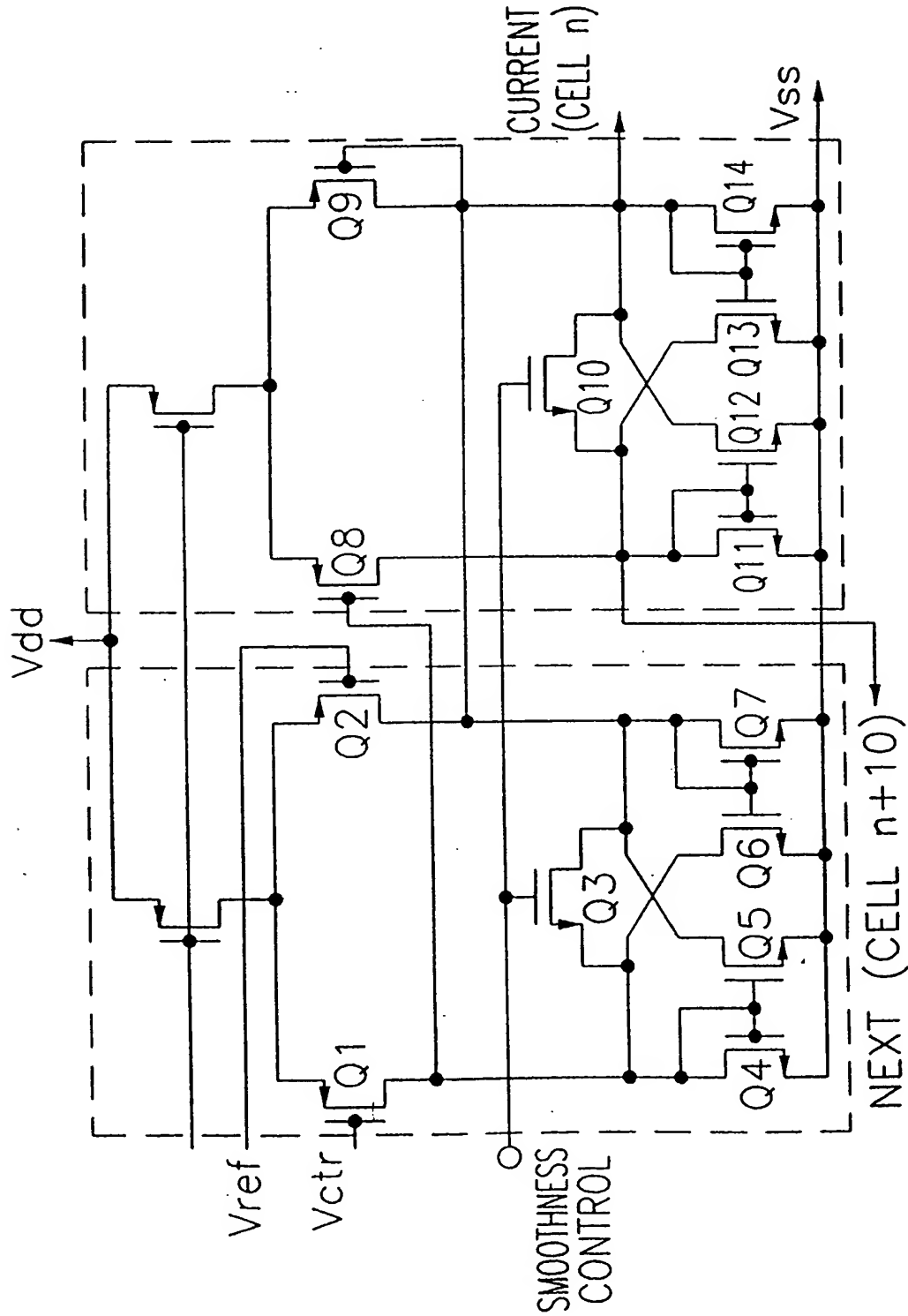
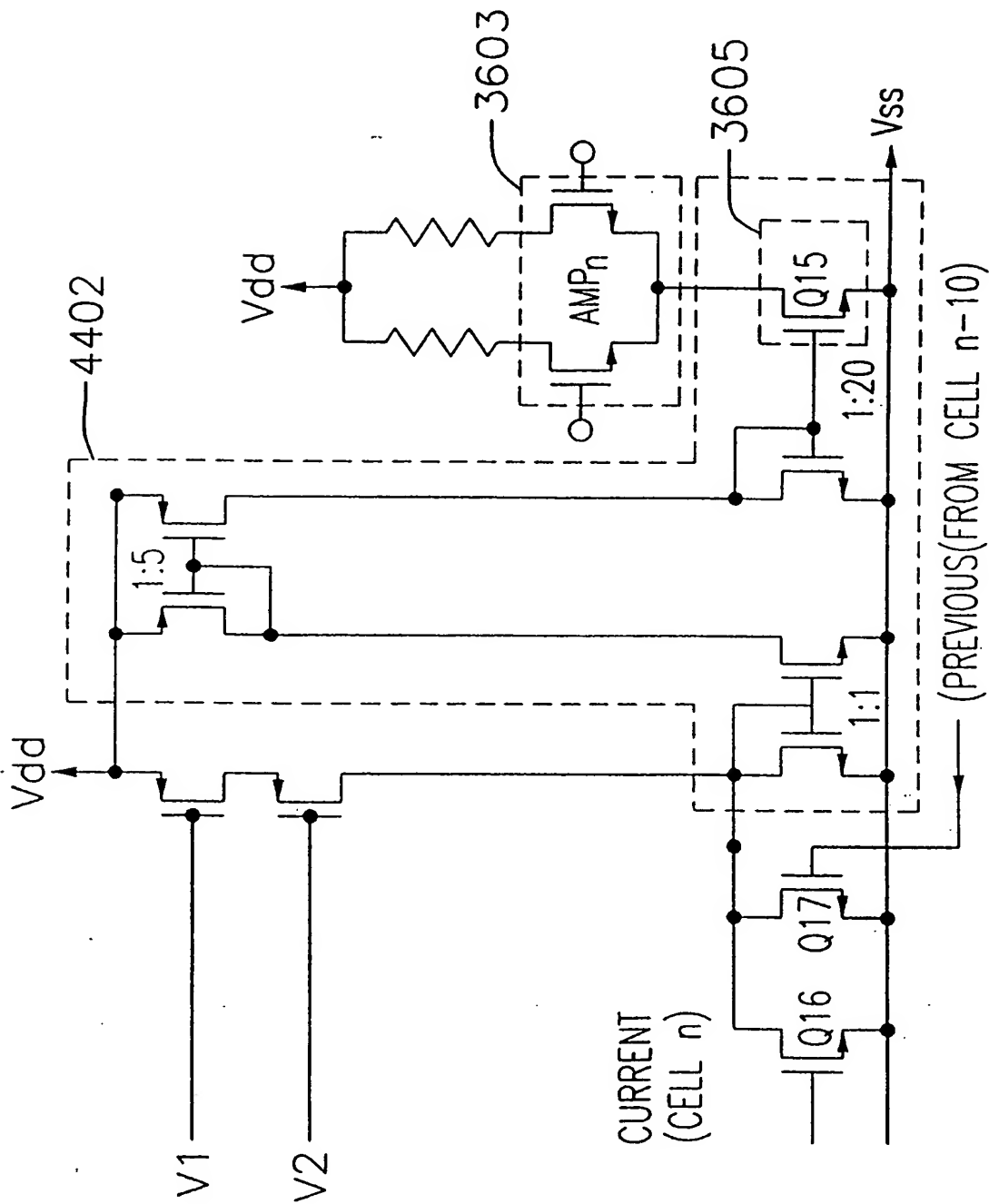


FIG. 44b



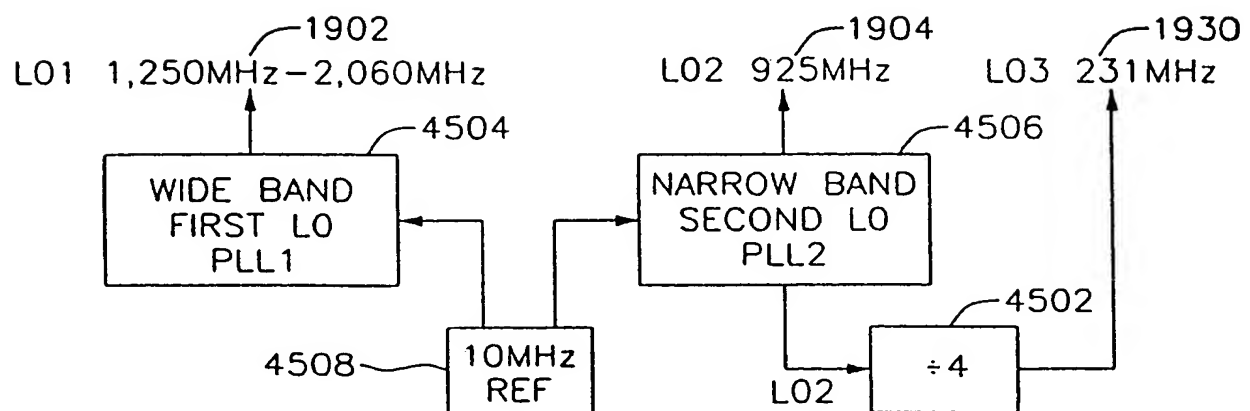
**FIG. 45**

FIG. 46

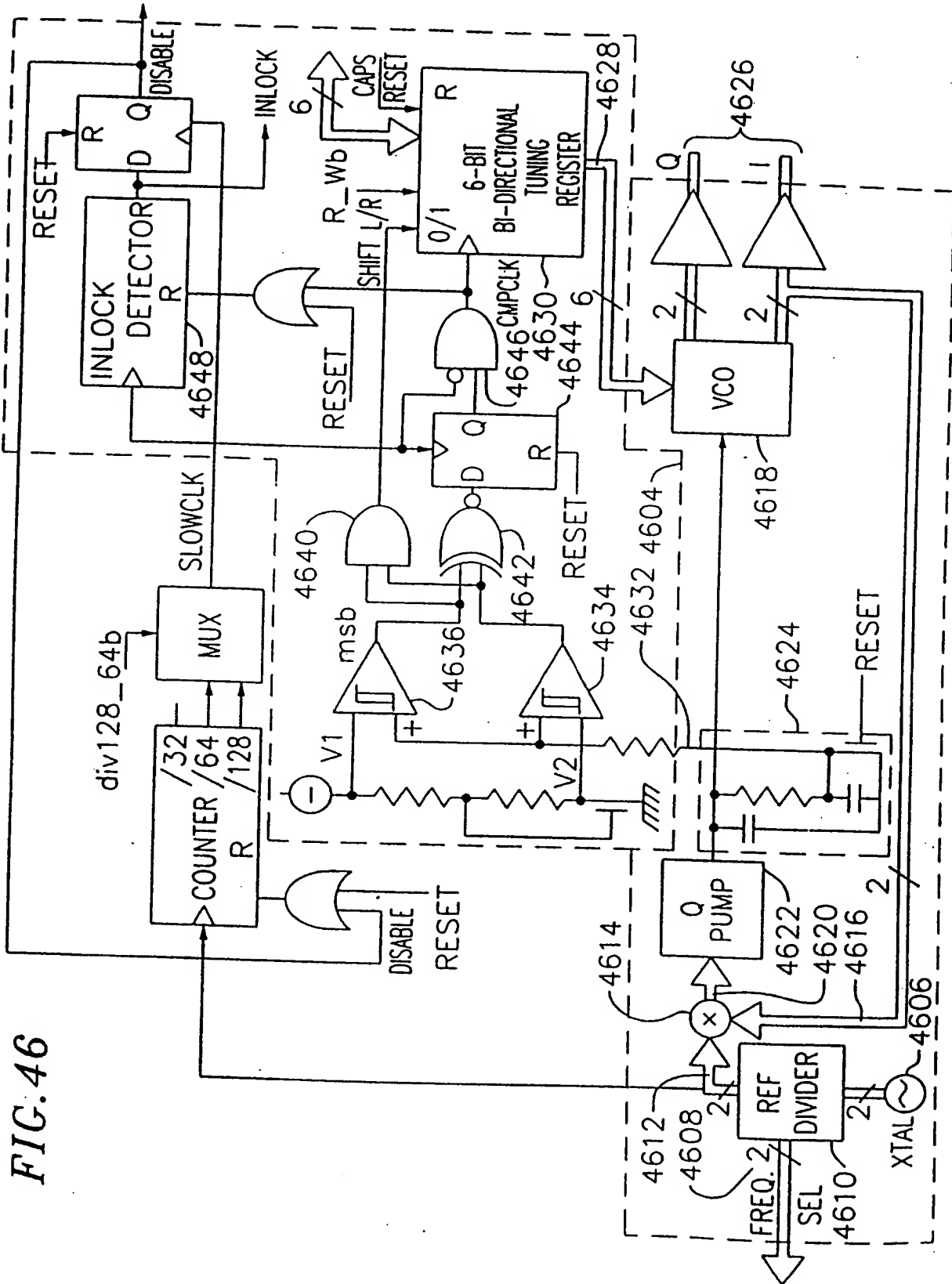
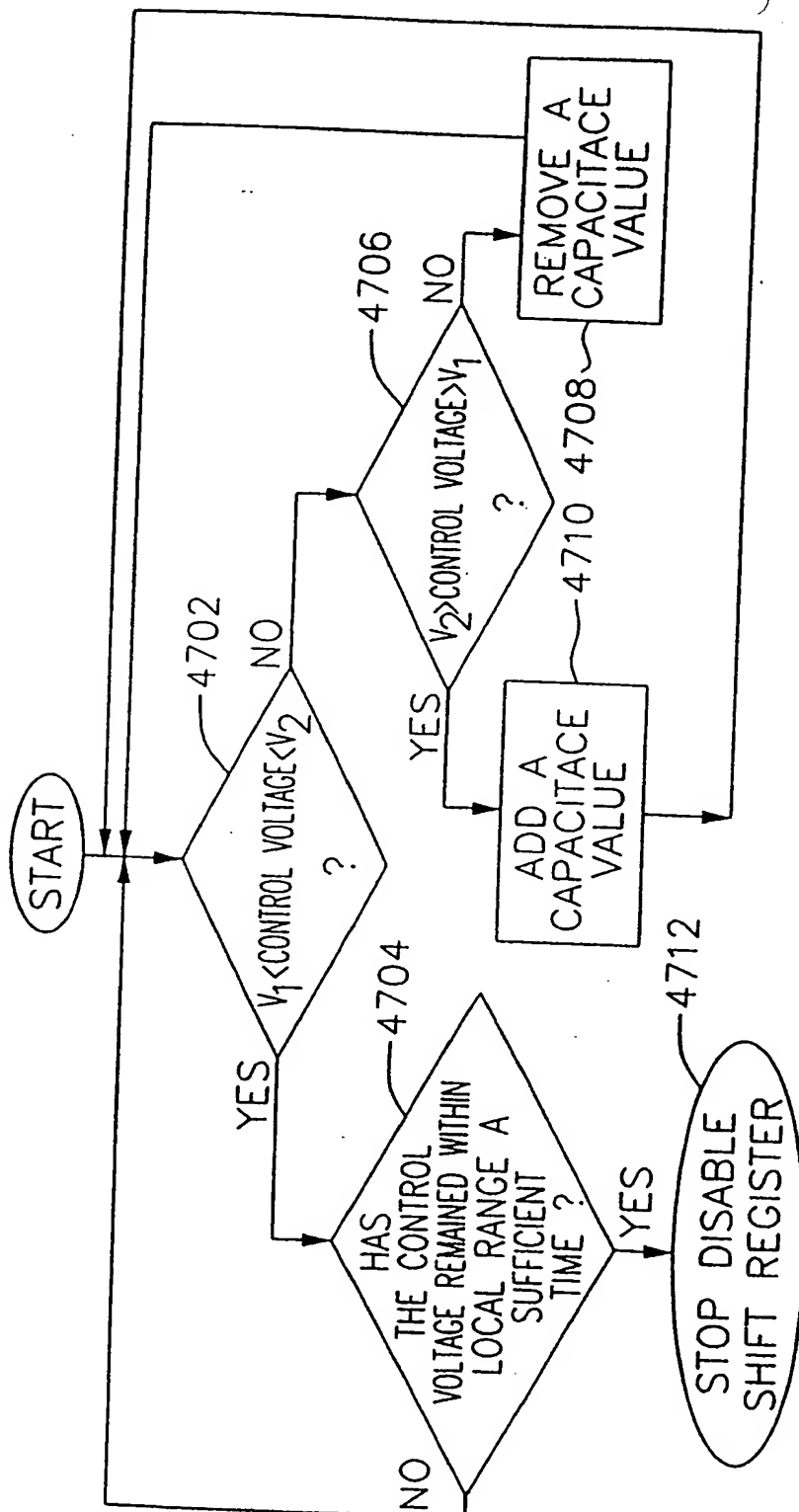


FIG. 47



Appl. No. To Be Assigned; Filed: Herewith  
 Dkt. No. 1875.138000G; Group Art Unit: To Be Assigned  
 Inventors: Arya R. Behzad; Tel.: (202) 371-2600  
 Title: Large Gain Range, High Linearity, Low Noise MOS  
 VGA

FIG. 48

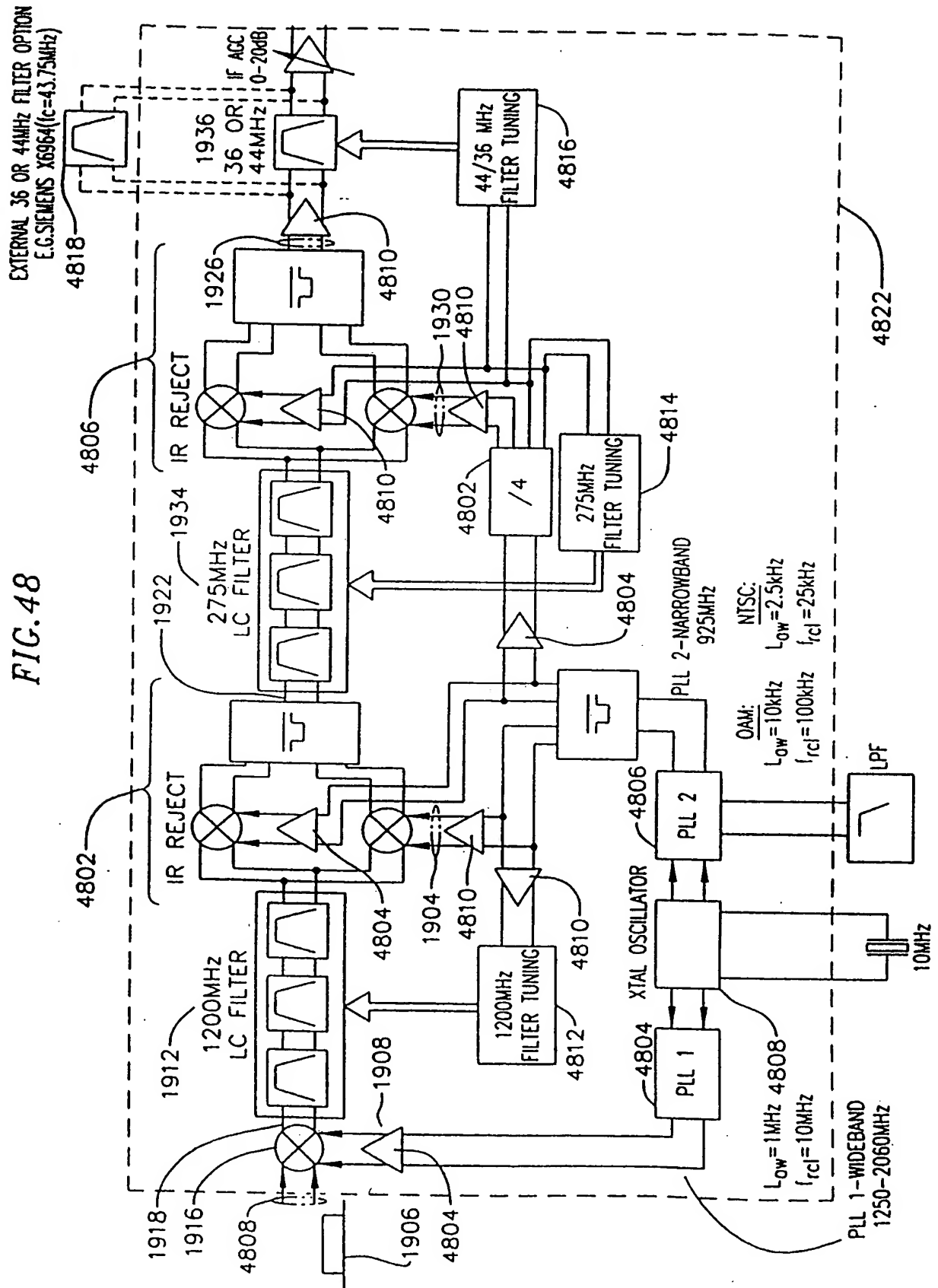




FIG. 49

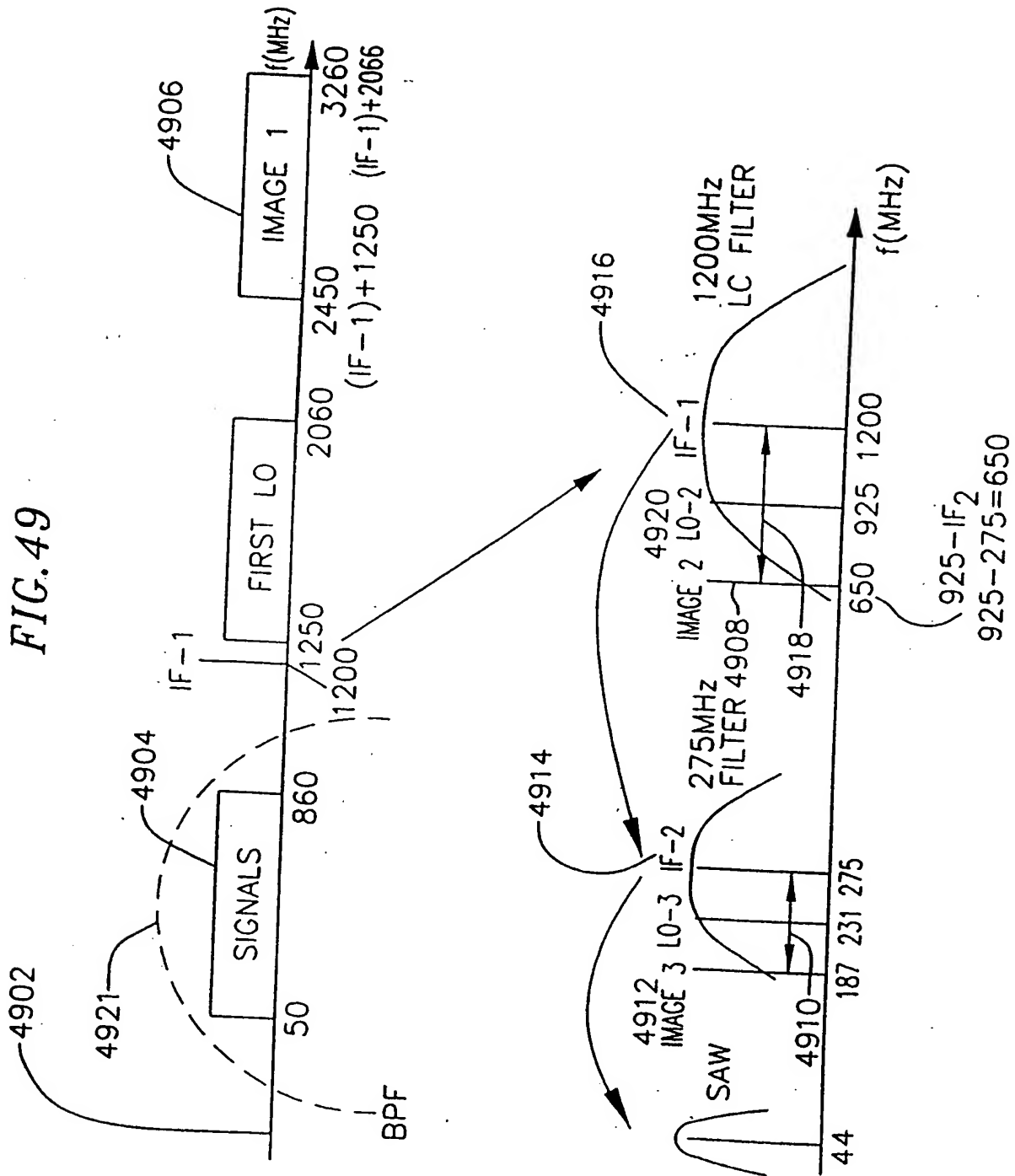
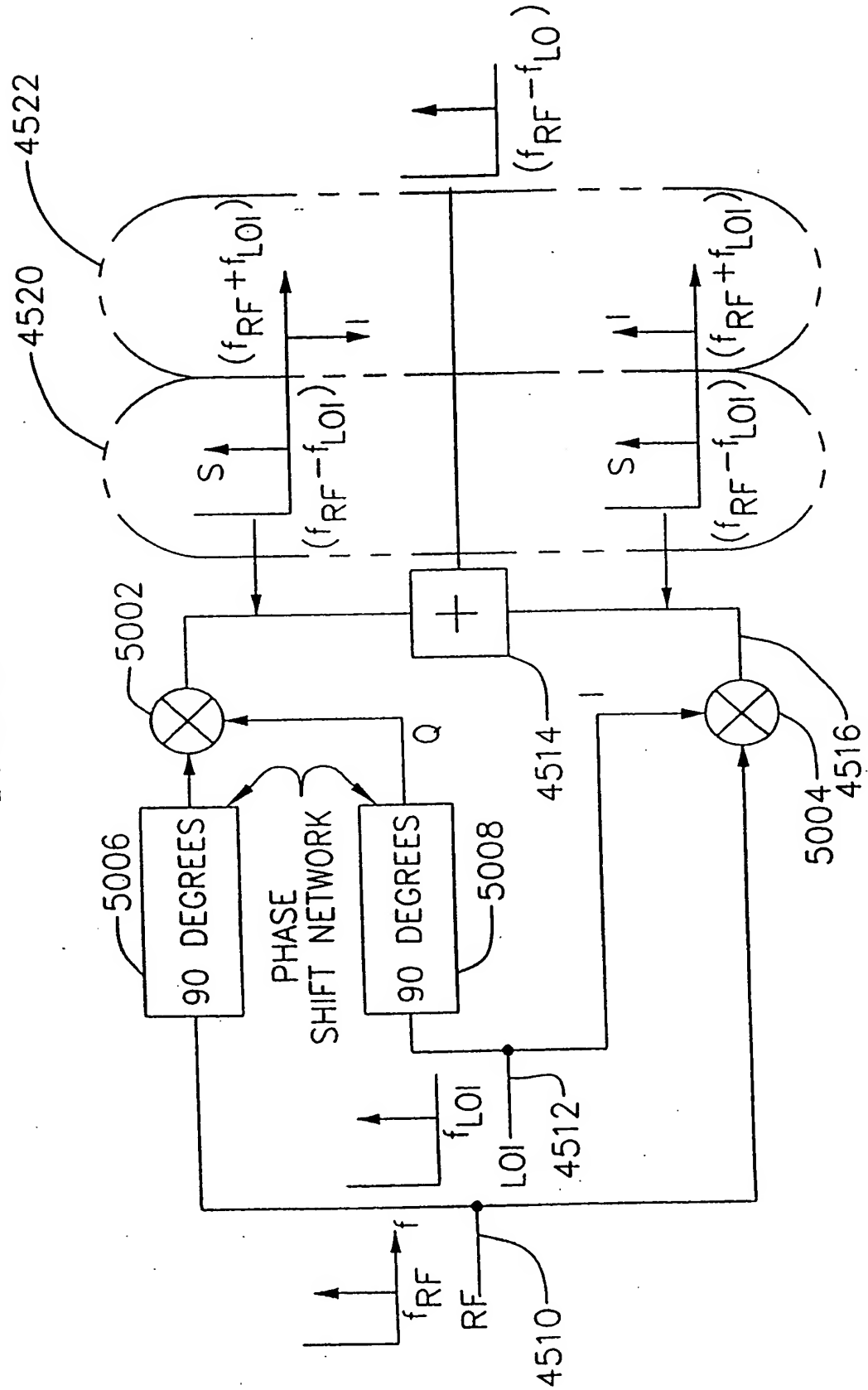
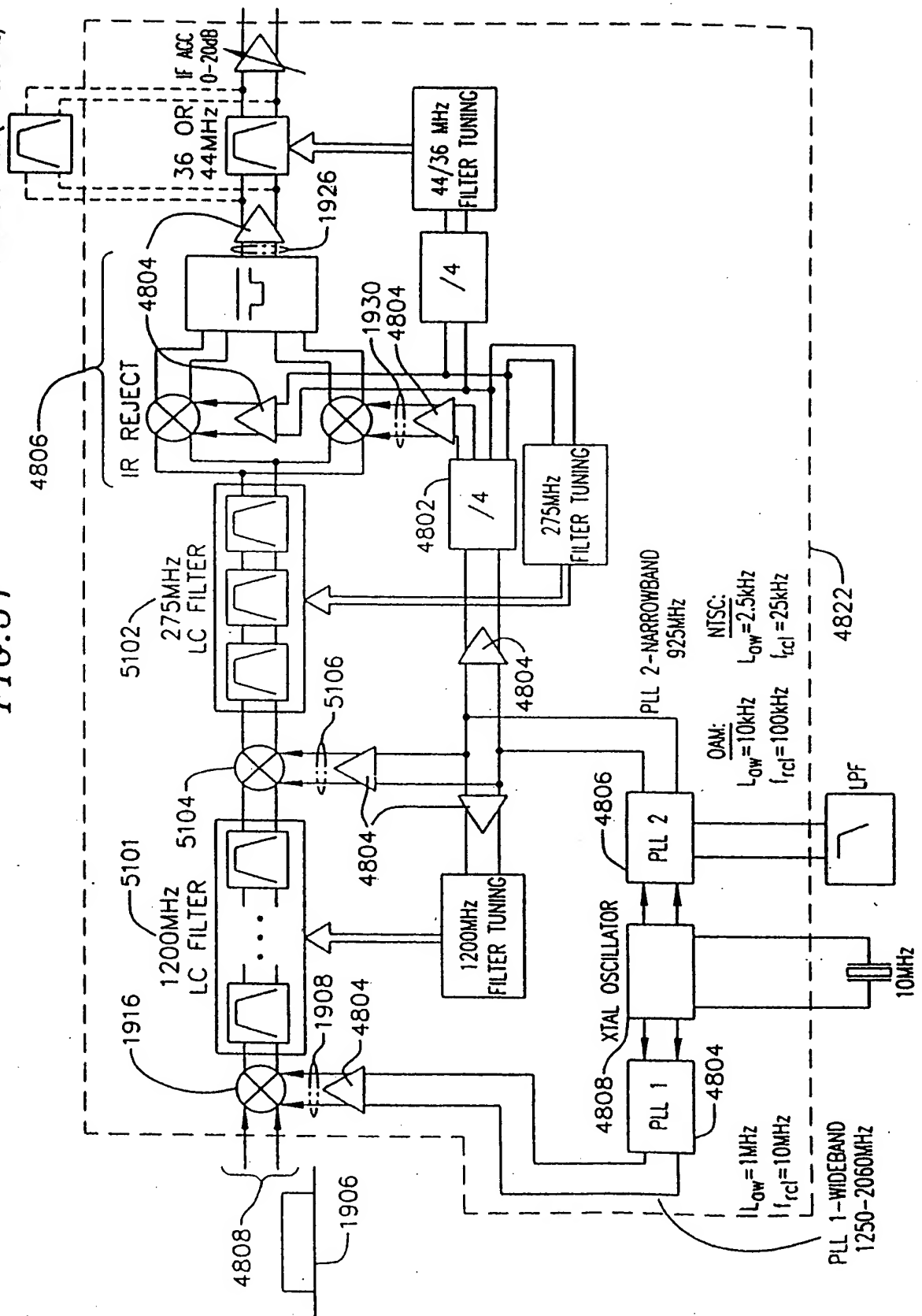


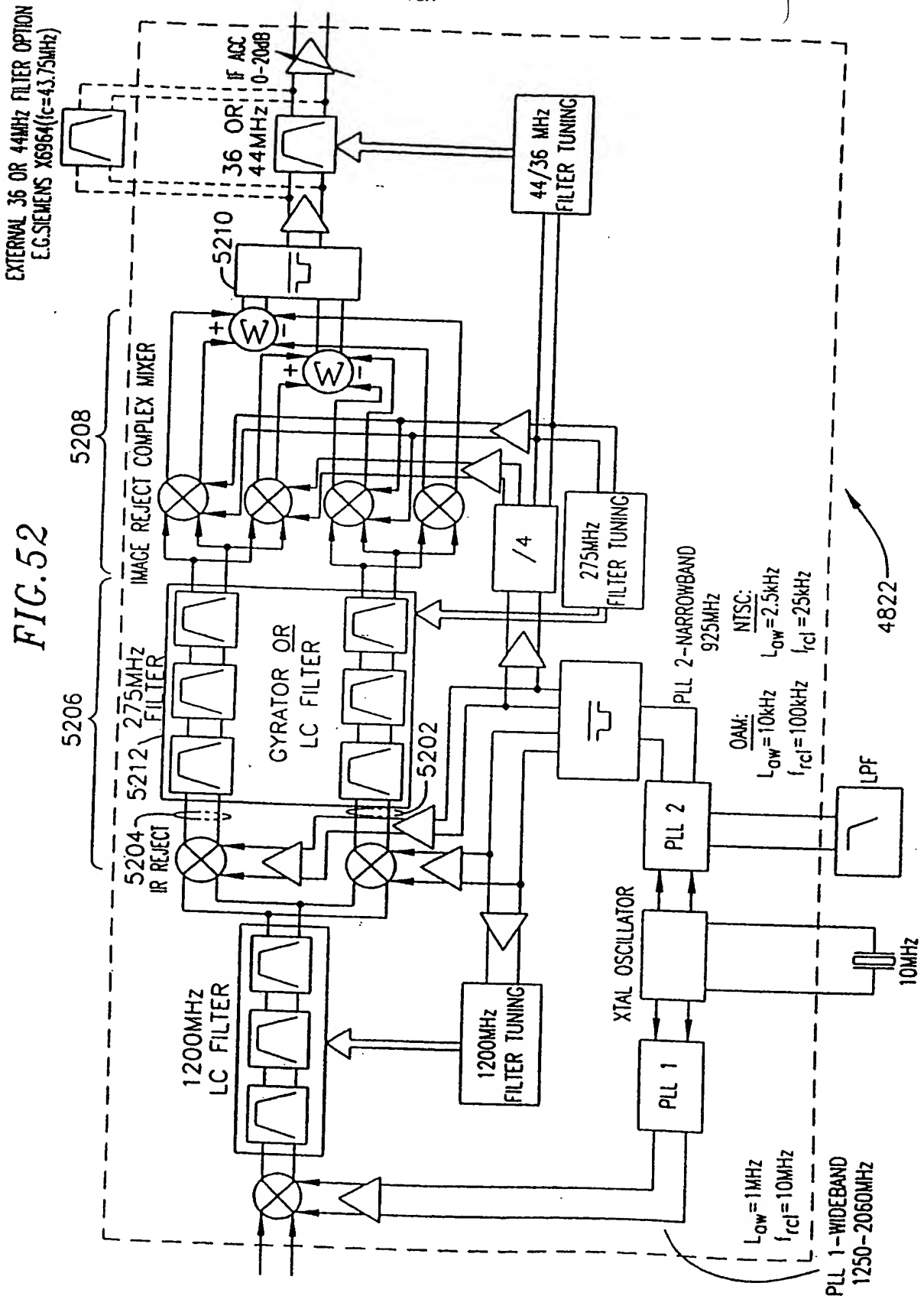
FIG. 50



EXTERNAL 36 OR 44MHz FILTER OPTION  
E.G. SIEMENS X6964 (f=43.75MHz)



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 VGA



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FIG. 53  
 CATV TUNER

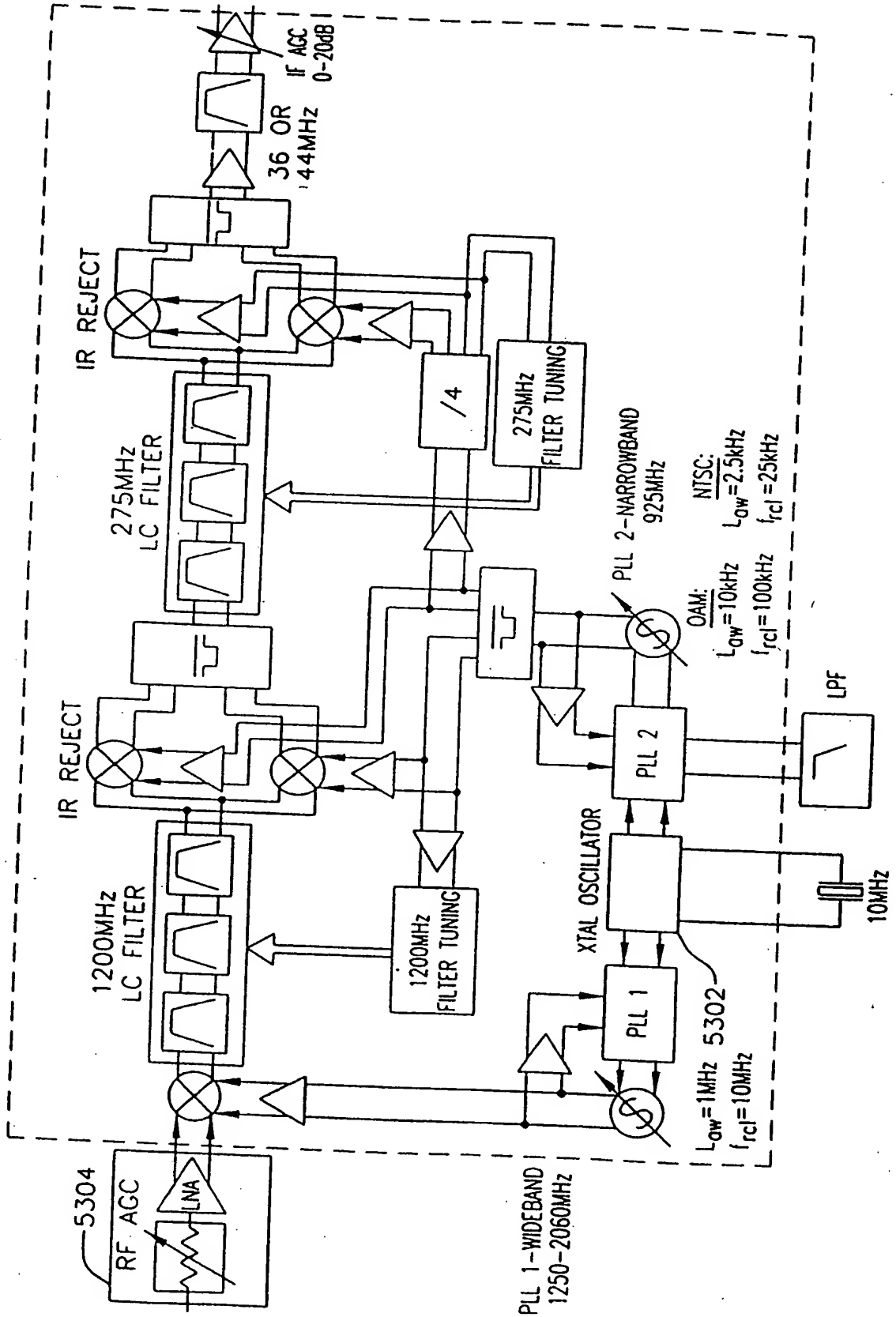


FIG. 54

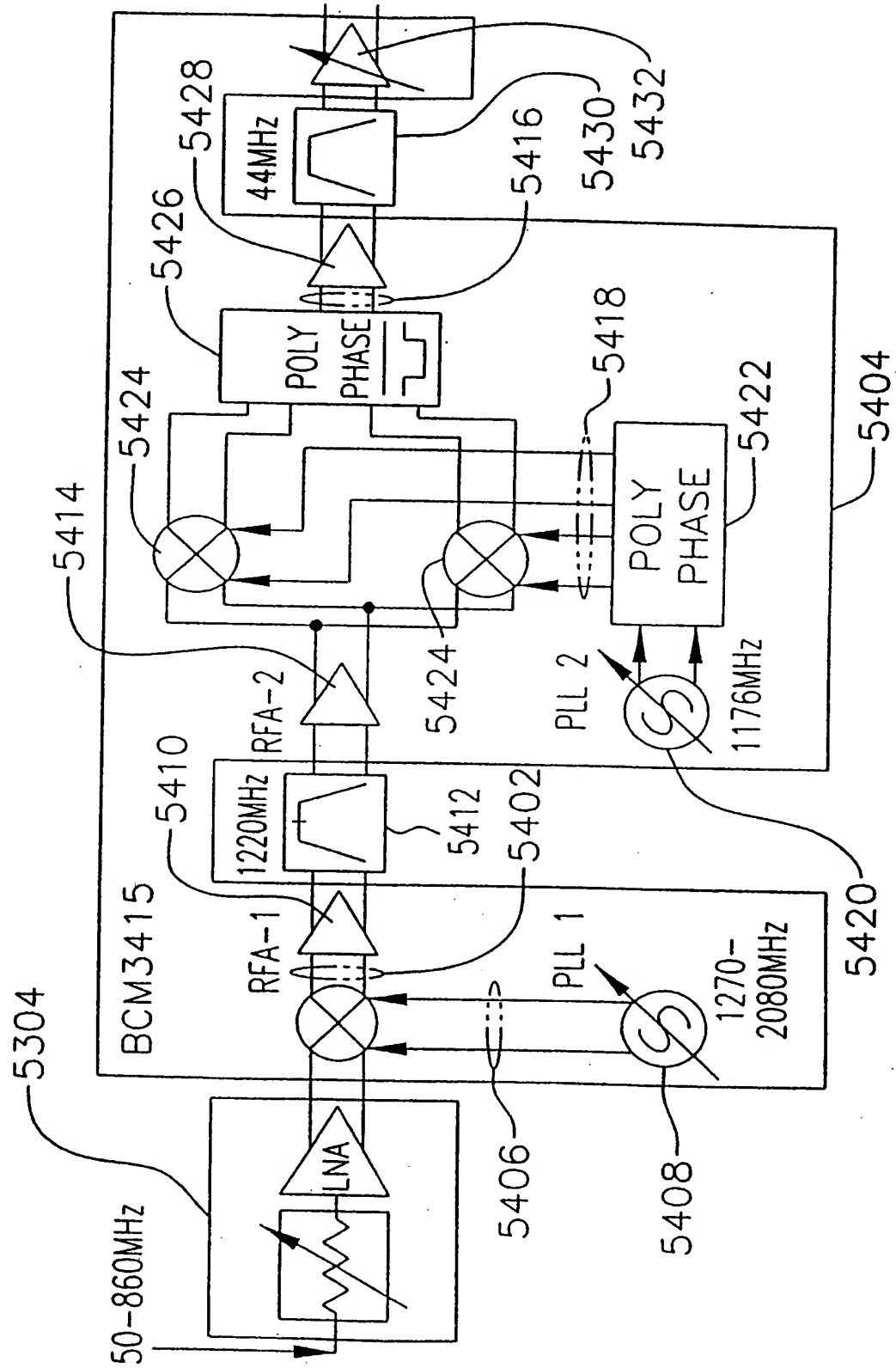
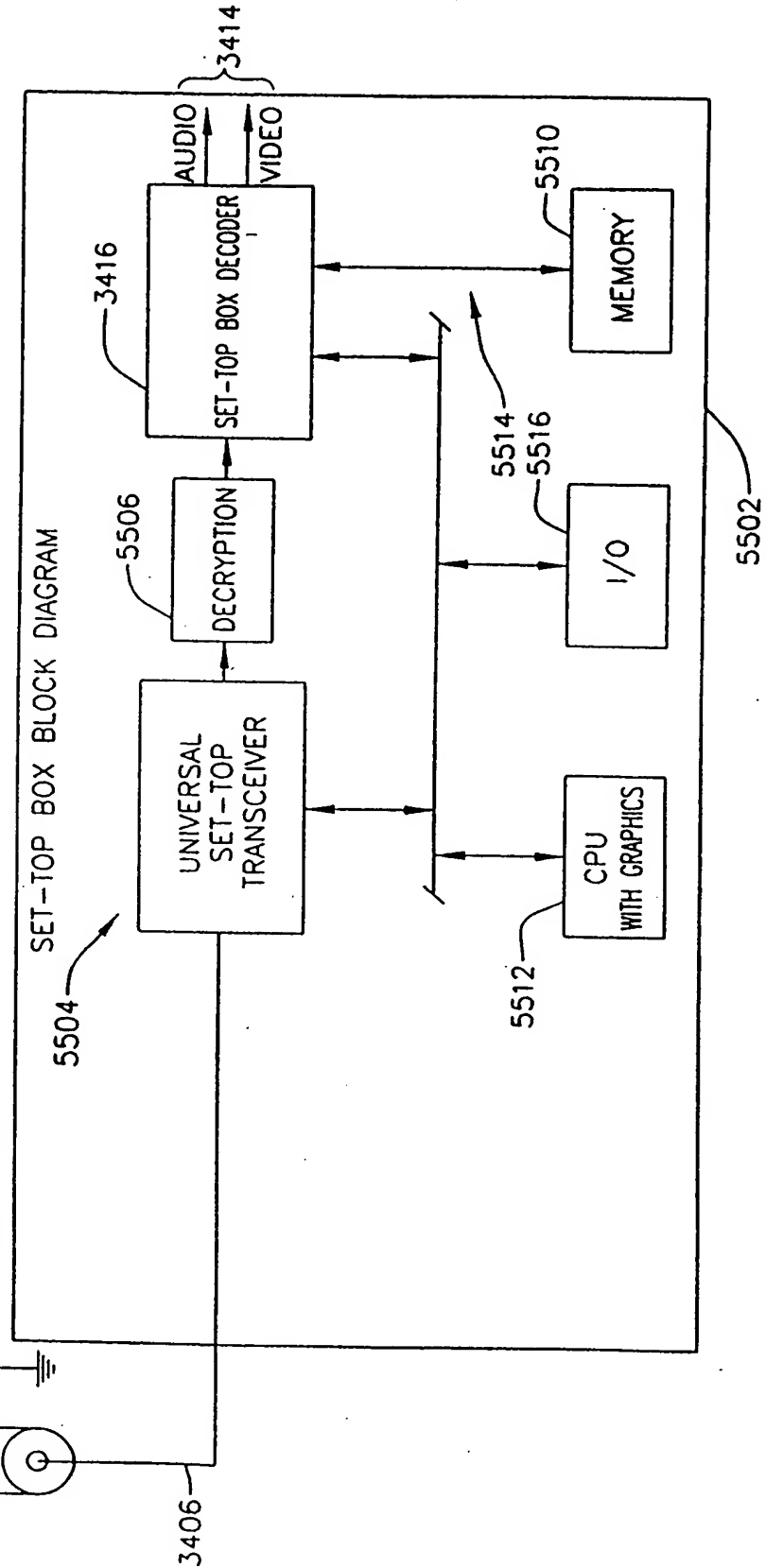
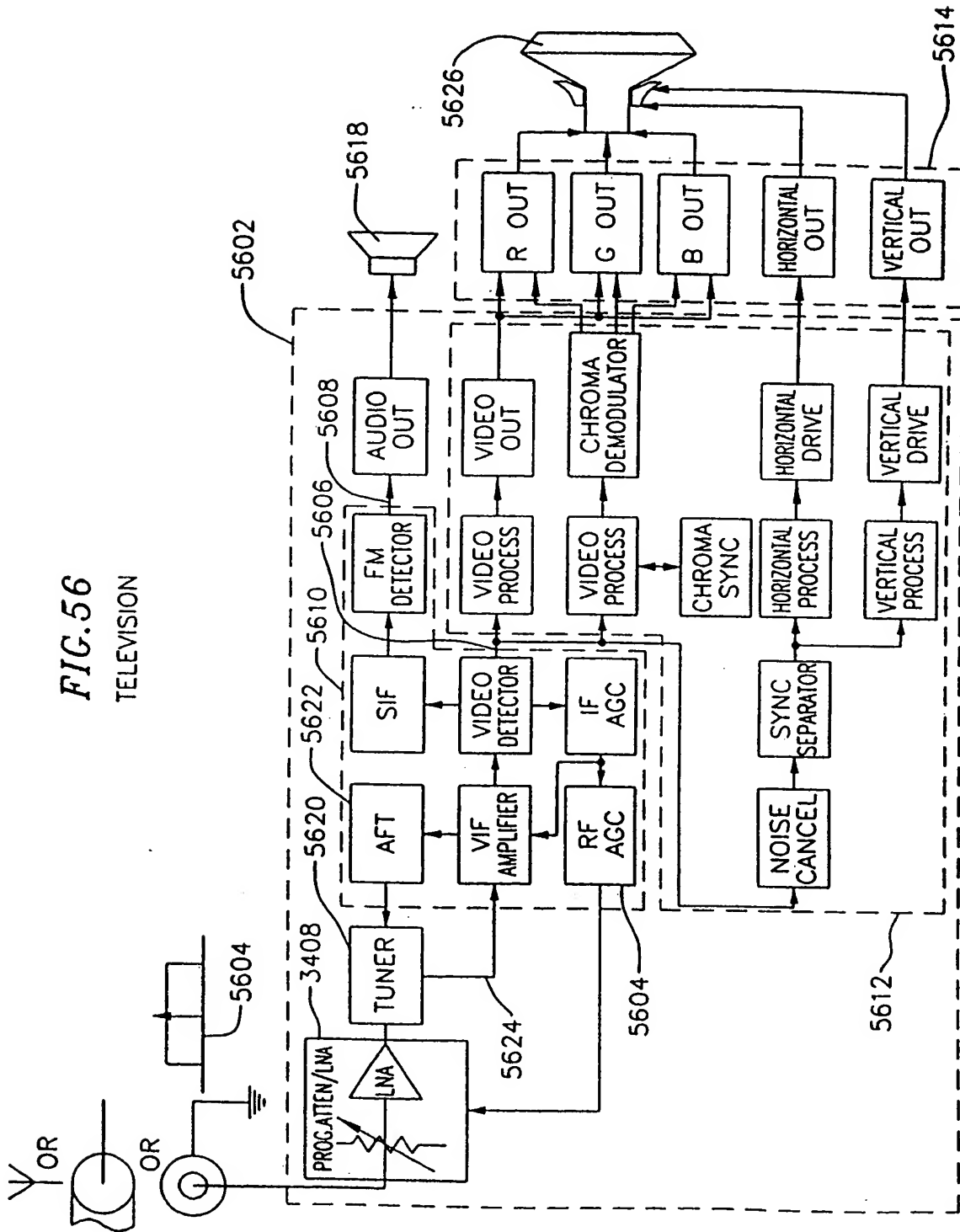


Diagram illustrating a packet structure. A block labeled **HEADEND** (5514) is connected to a block labeled **5508**.



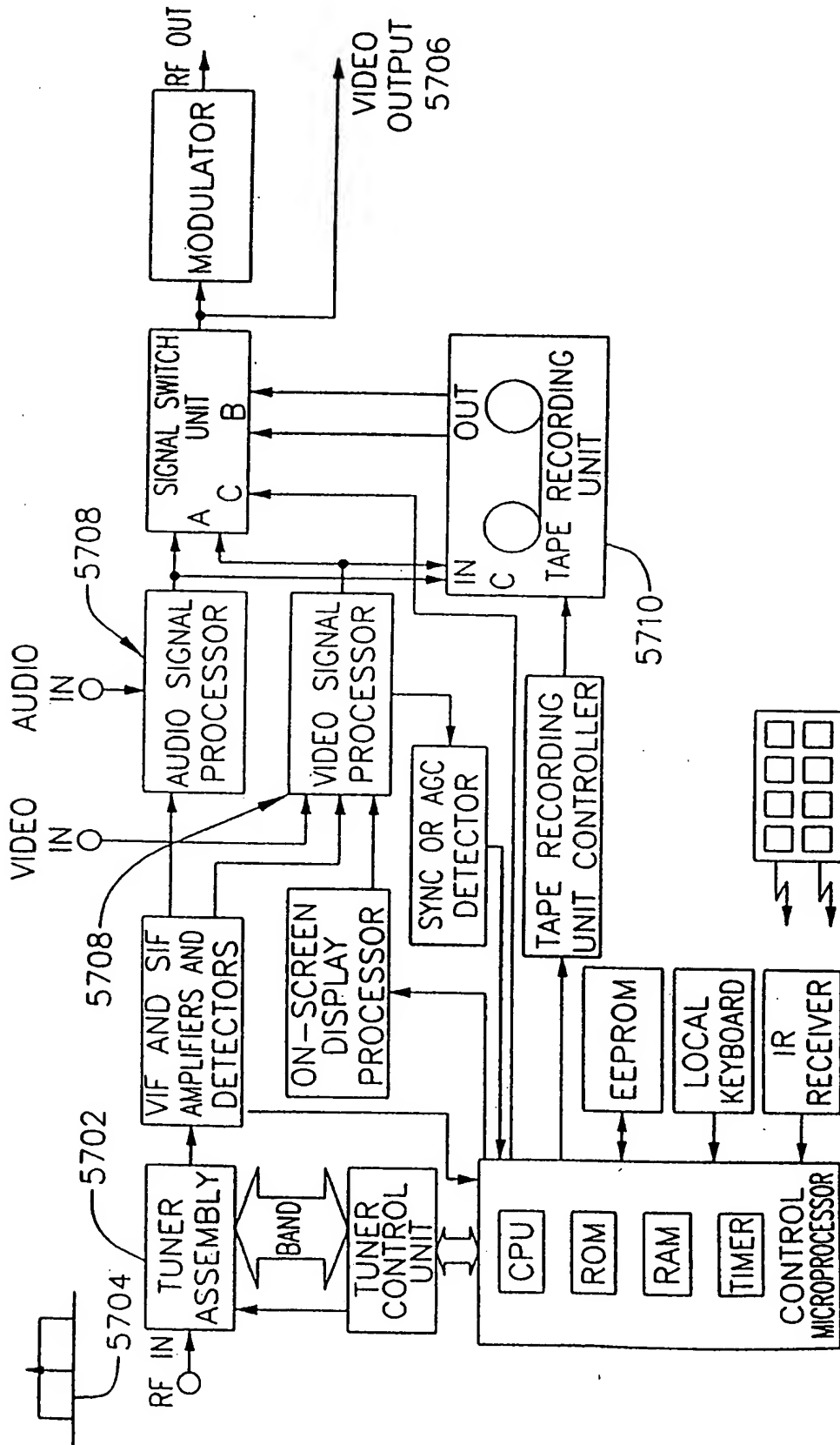
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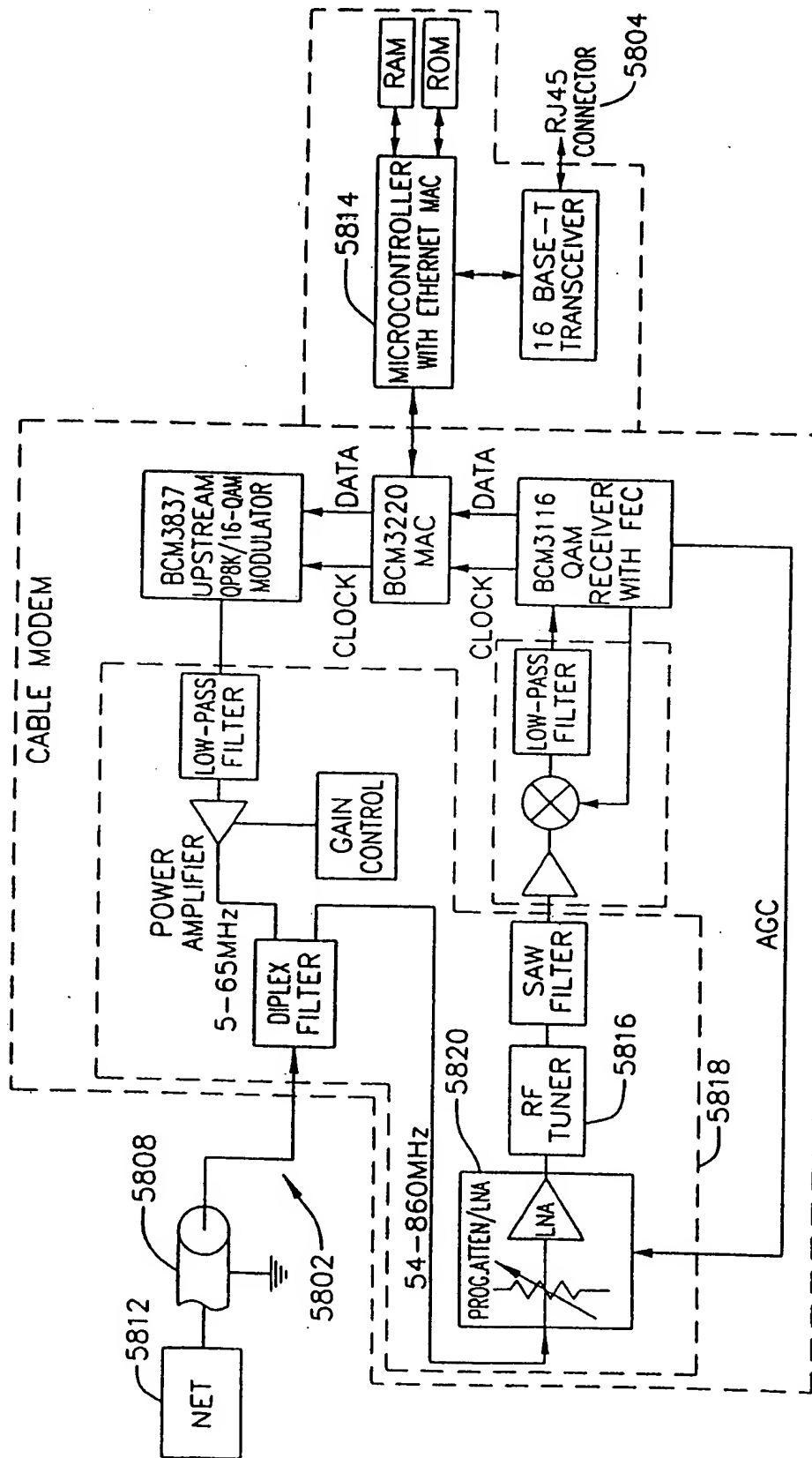
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**FIG. 57**  
 VCR BLOCK DIAGRAM

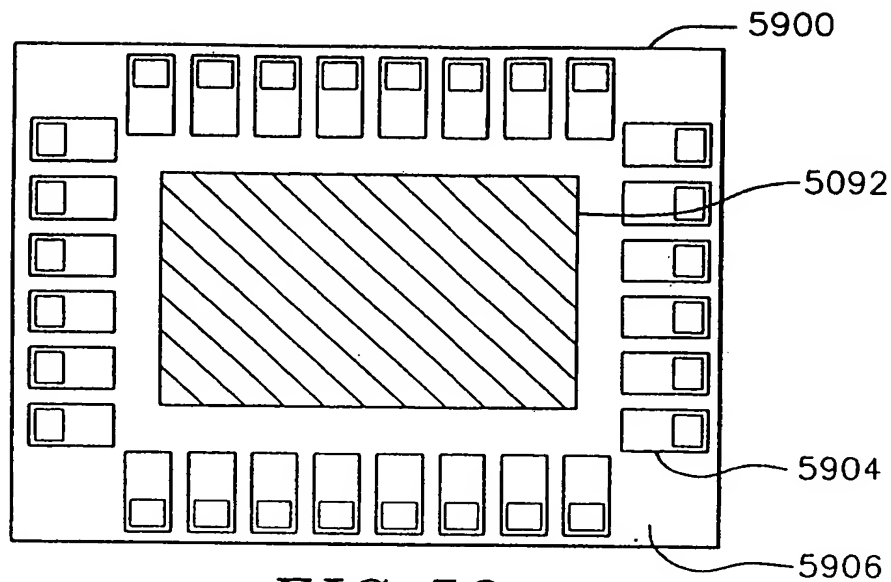


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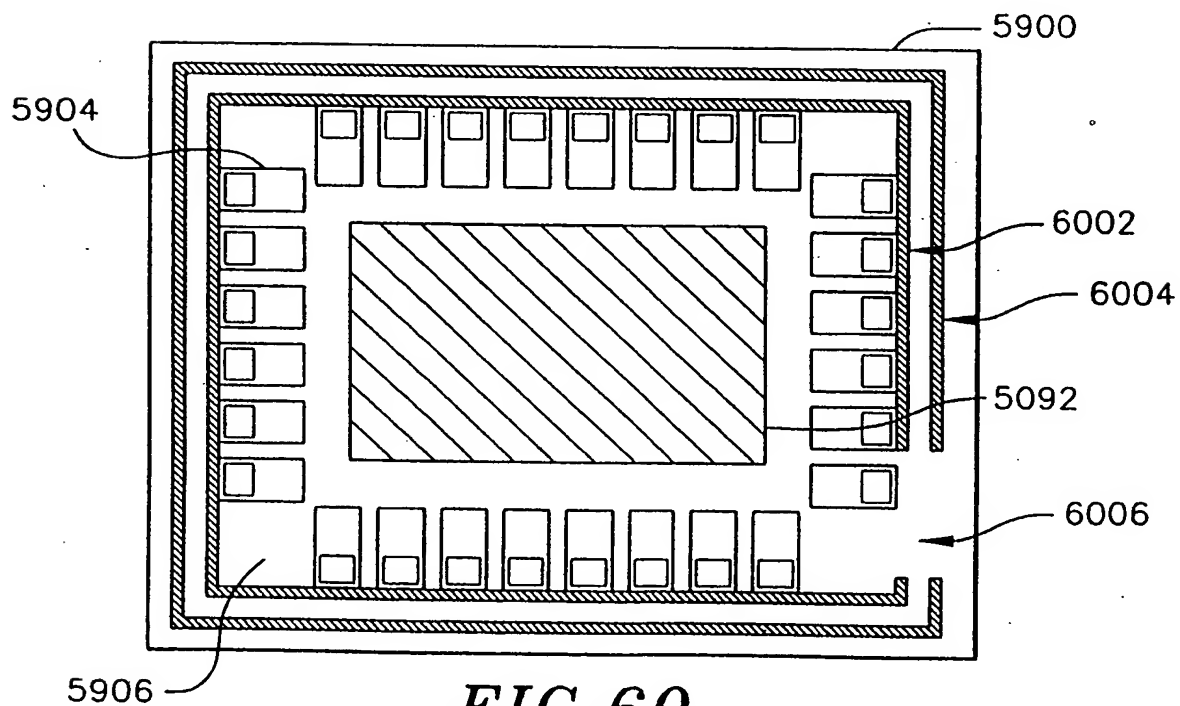
FIG. 58



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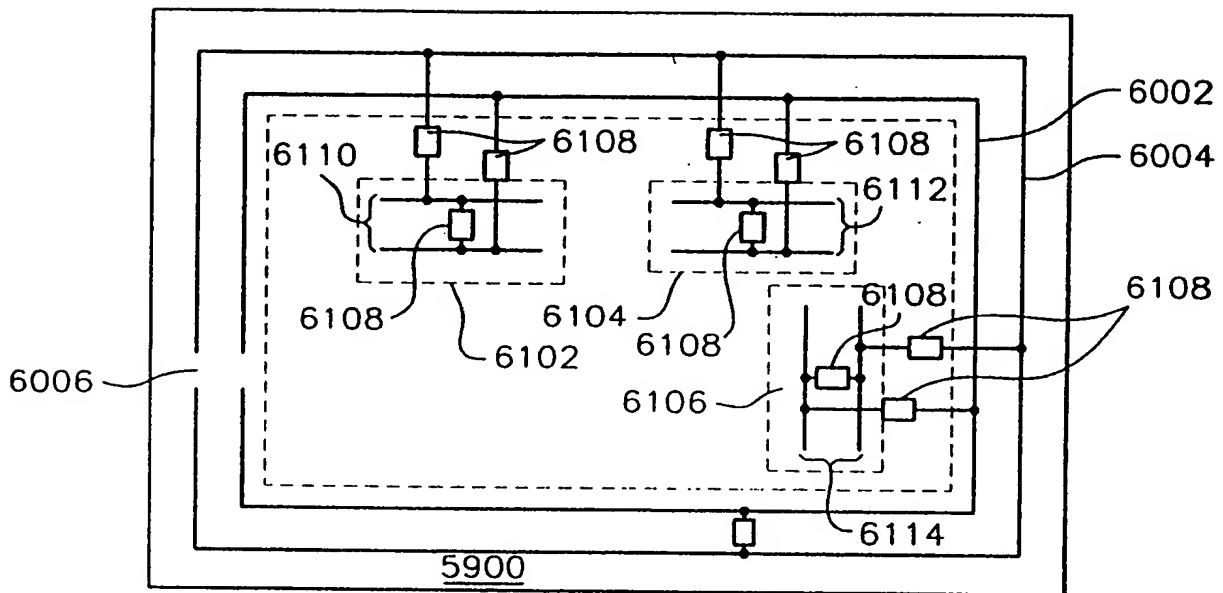


**FIG. 59**



**FIG. 60**

**FIG. 61**



**FIG. 62**

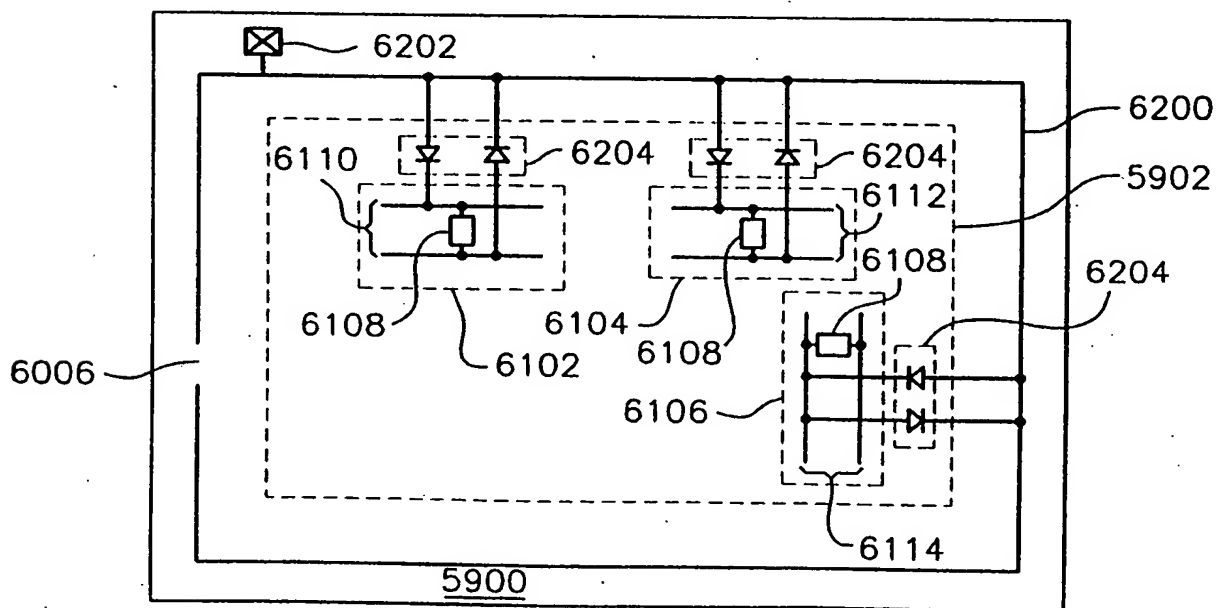
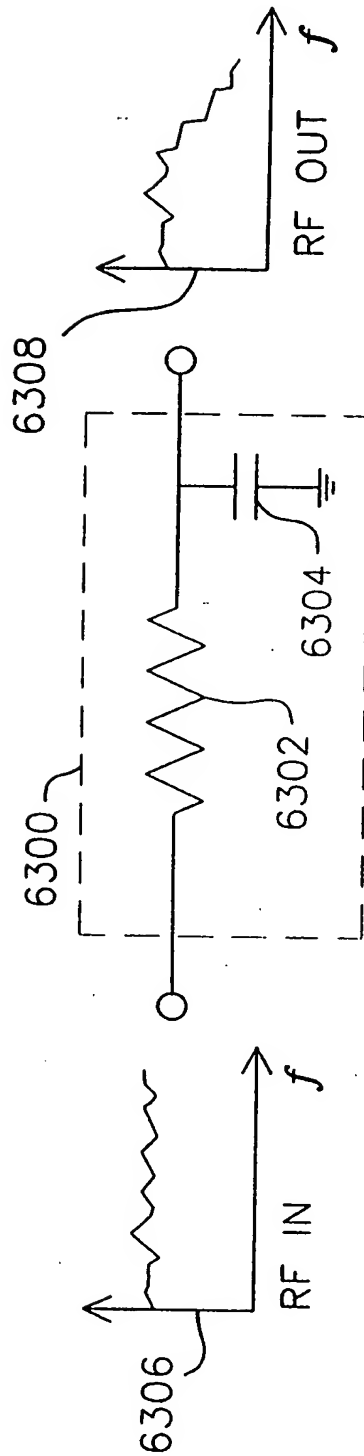
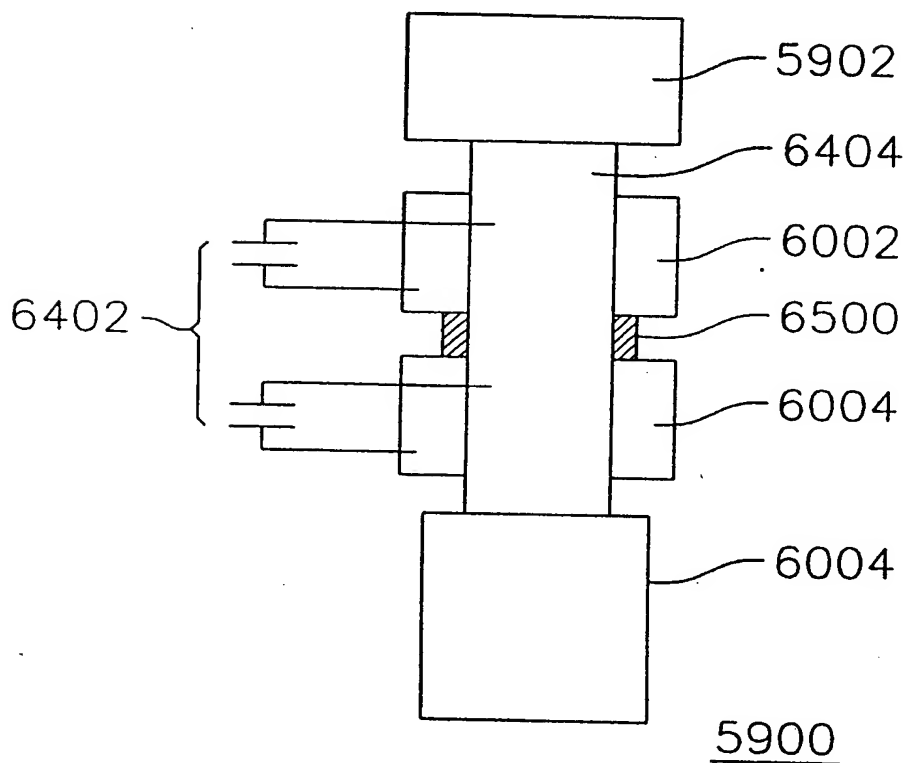


FIG. 63

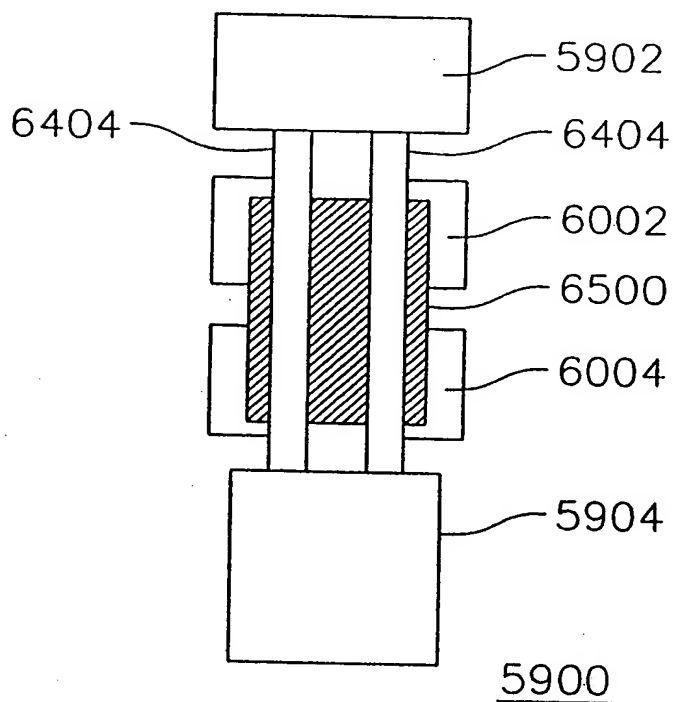


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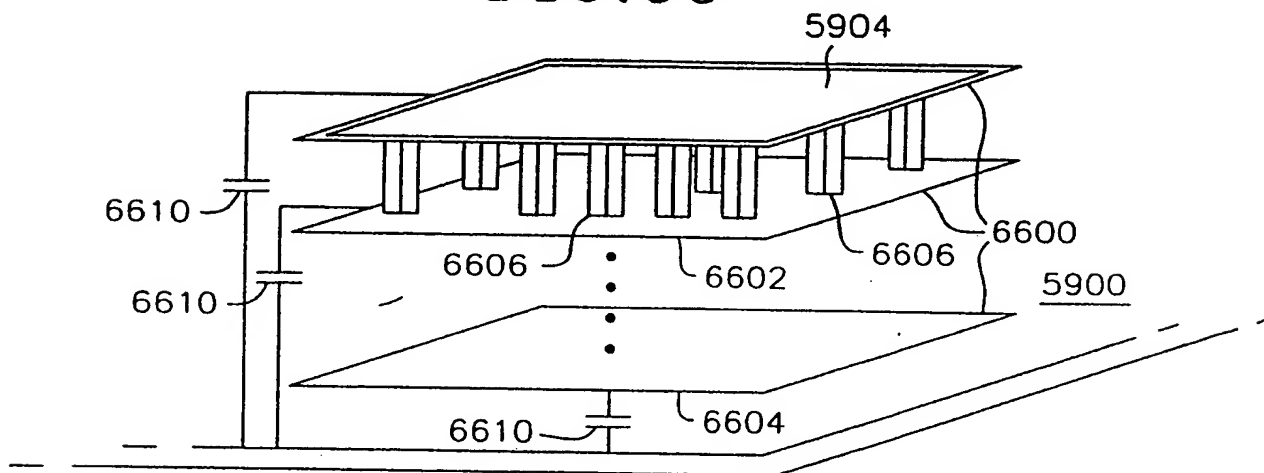
**FIG. 64**



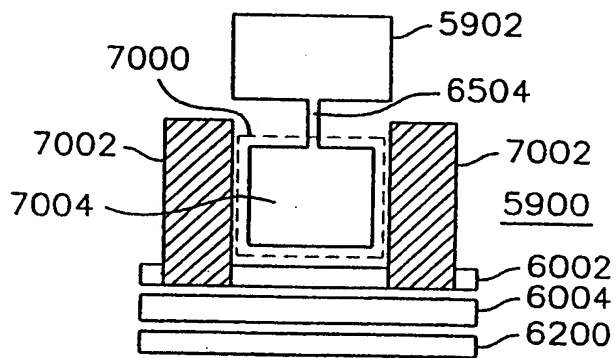
**FIG. 65**



**FIG. 66**

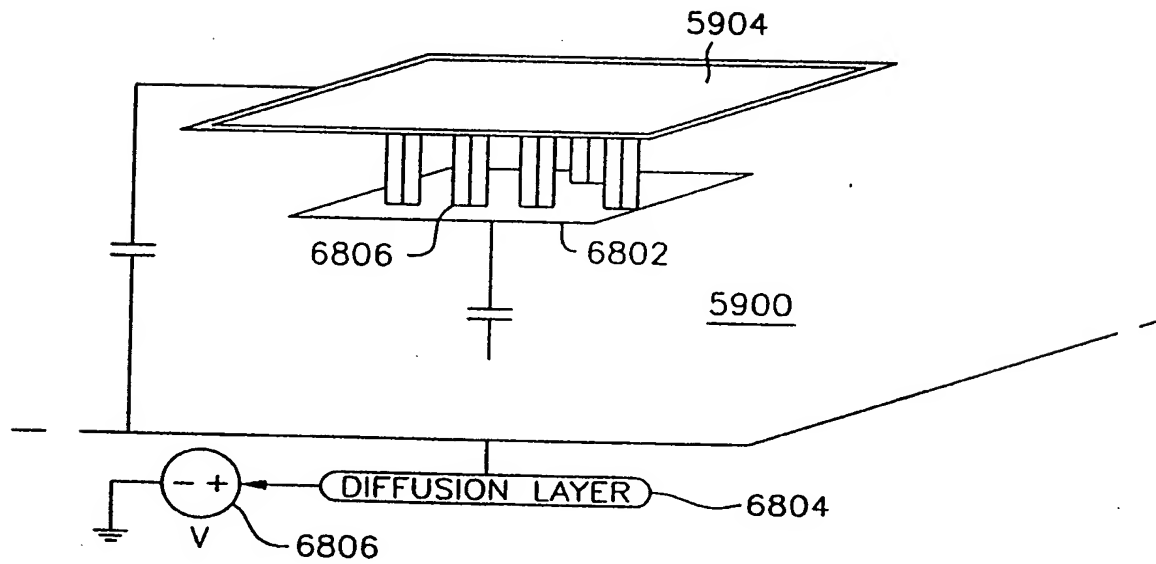


**FIG. 67**

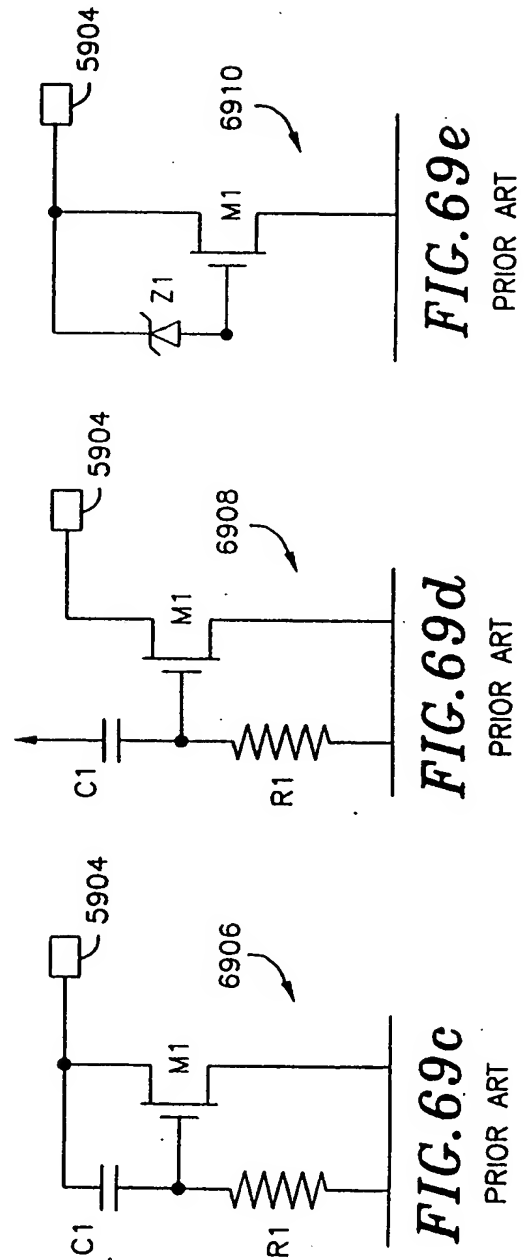
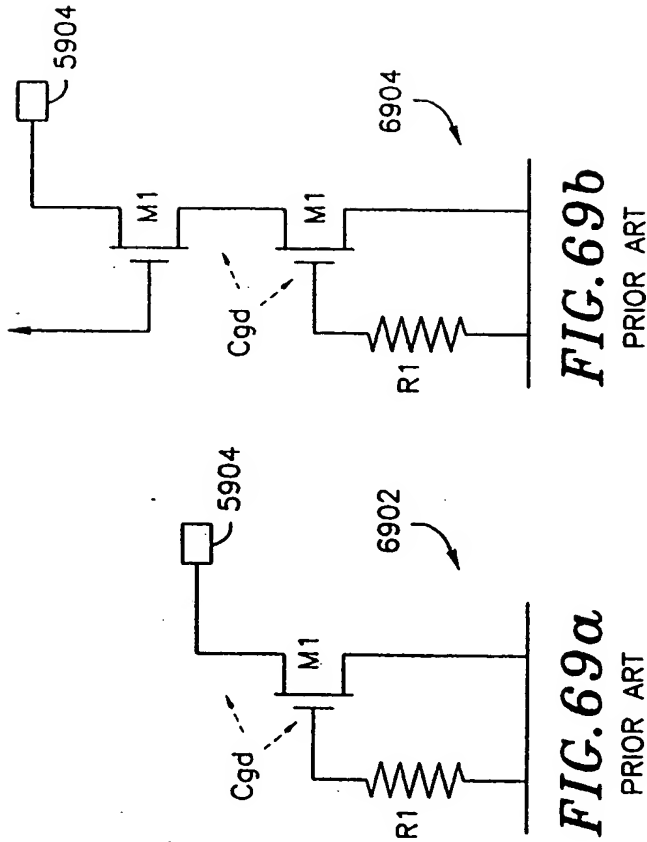


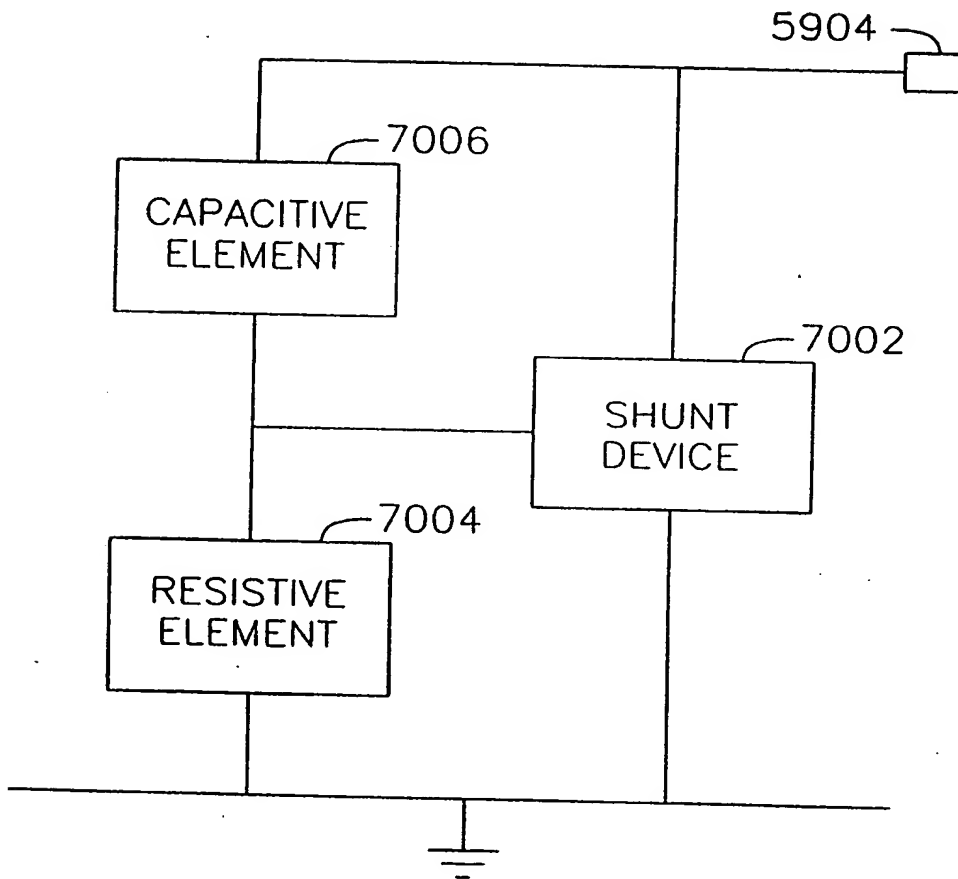


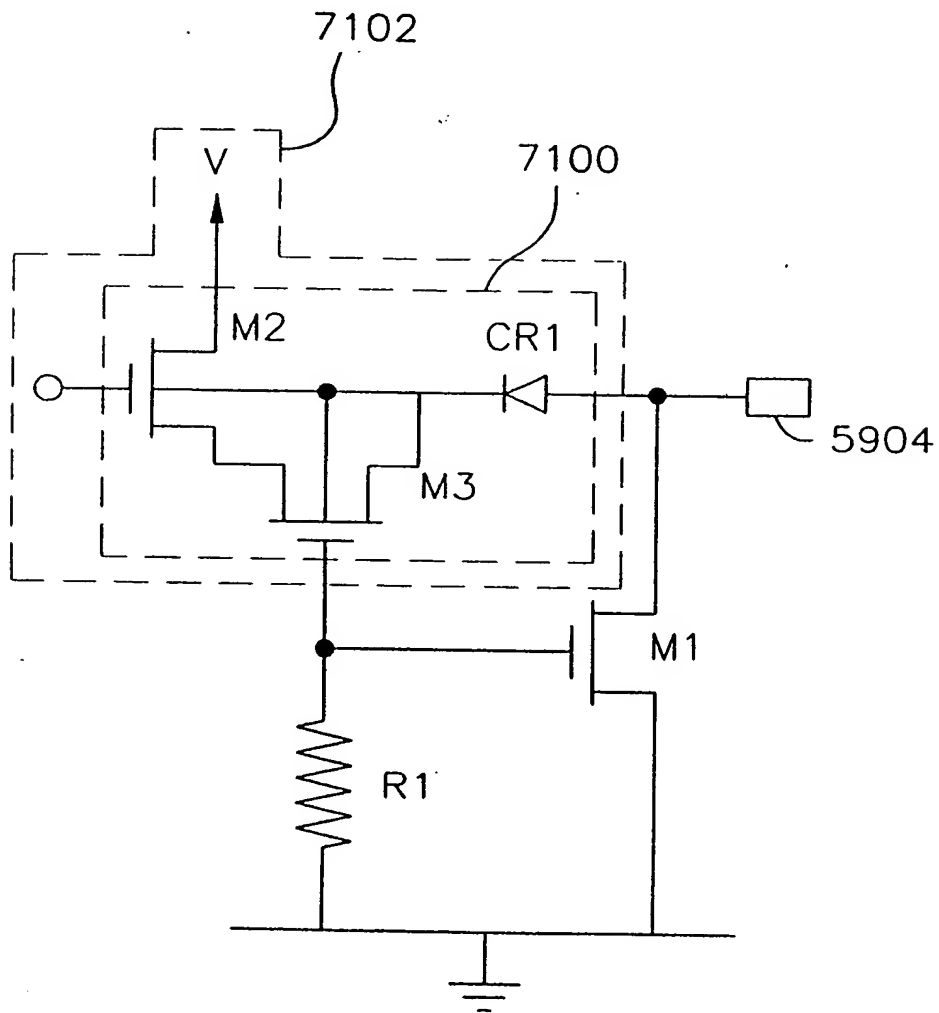
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**FIG. 68**

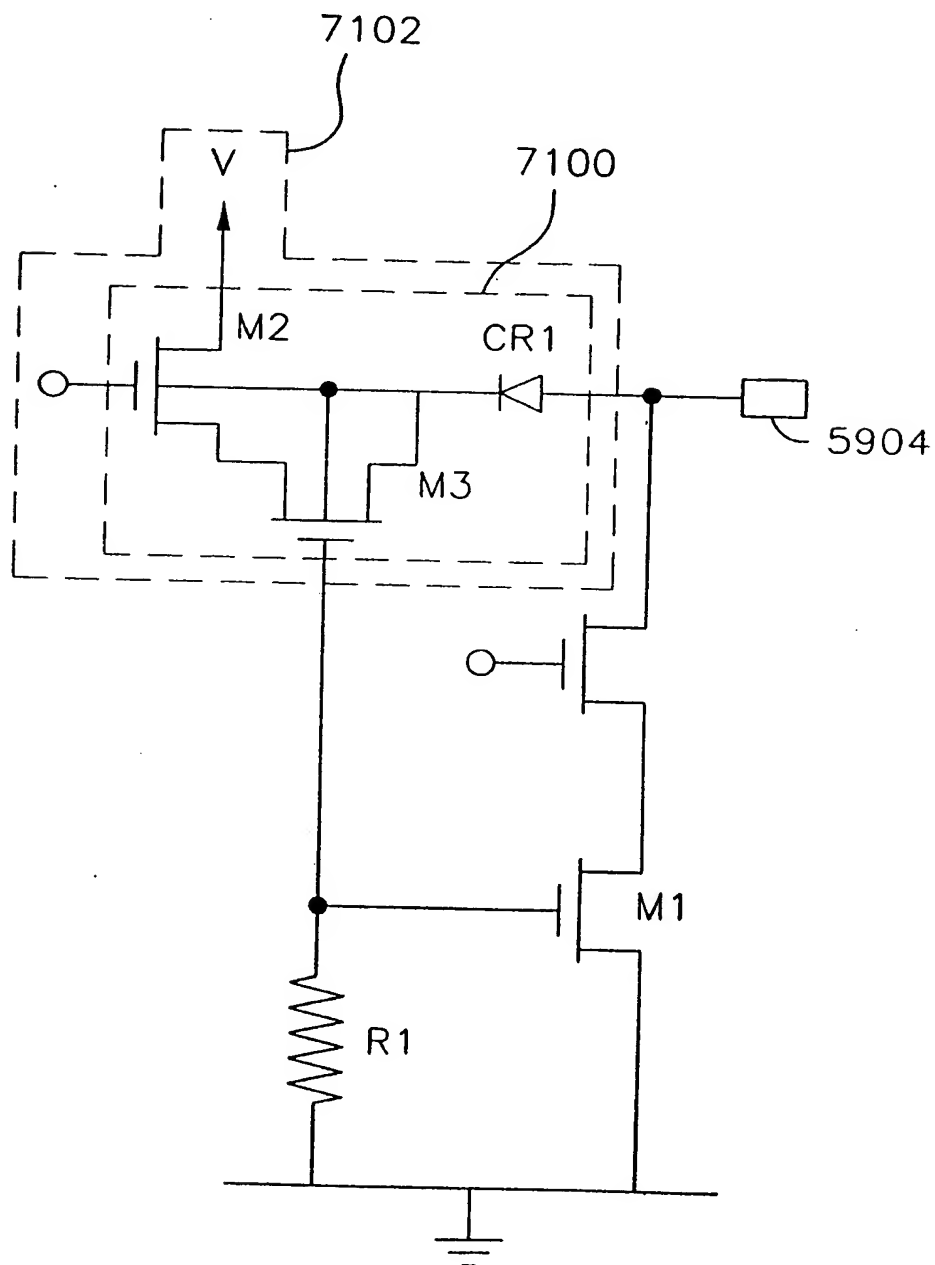
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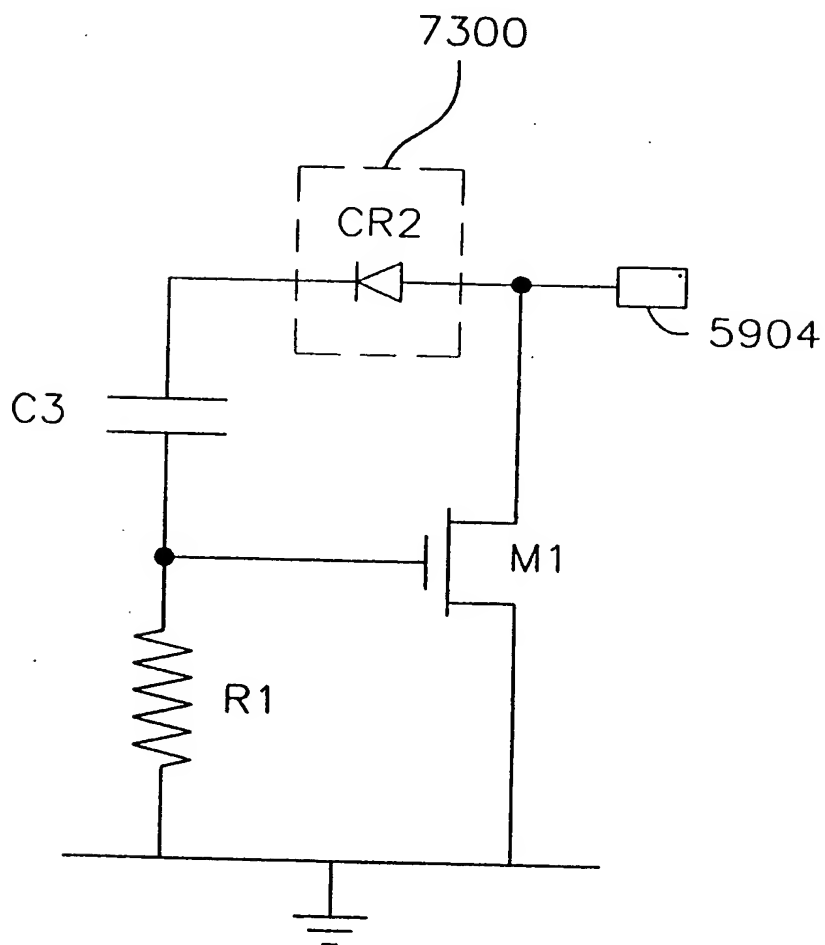


**FIG. 70**

**FIG. 71**

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**FIG. 72**

**FIG. 73**

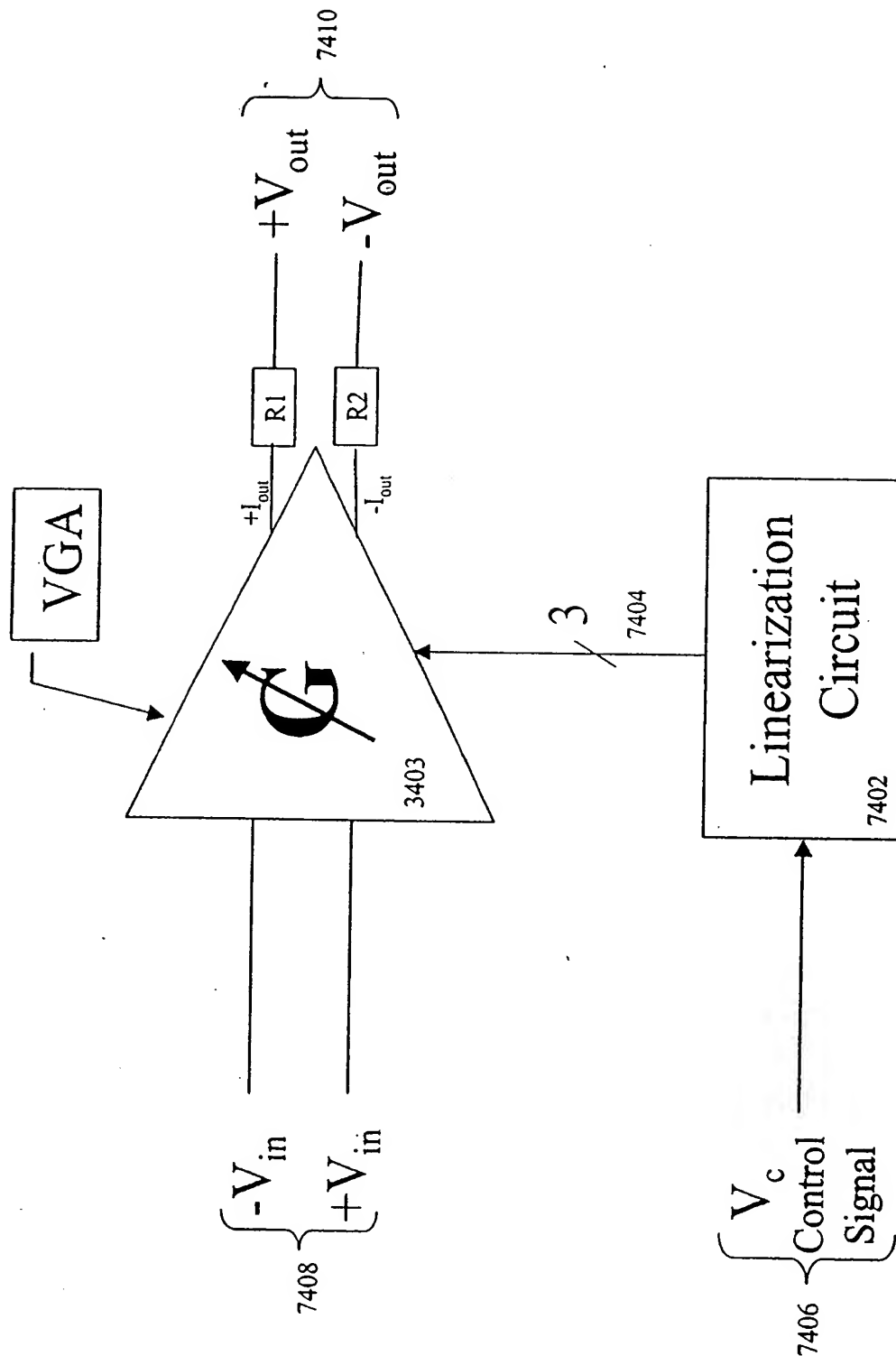


FIG. 74

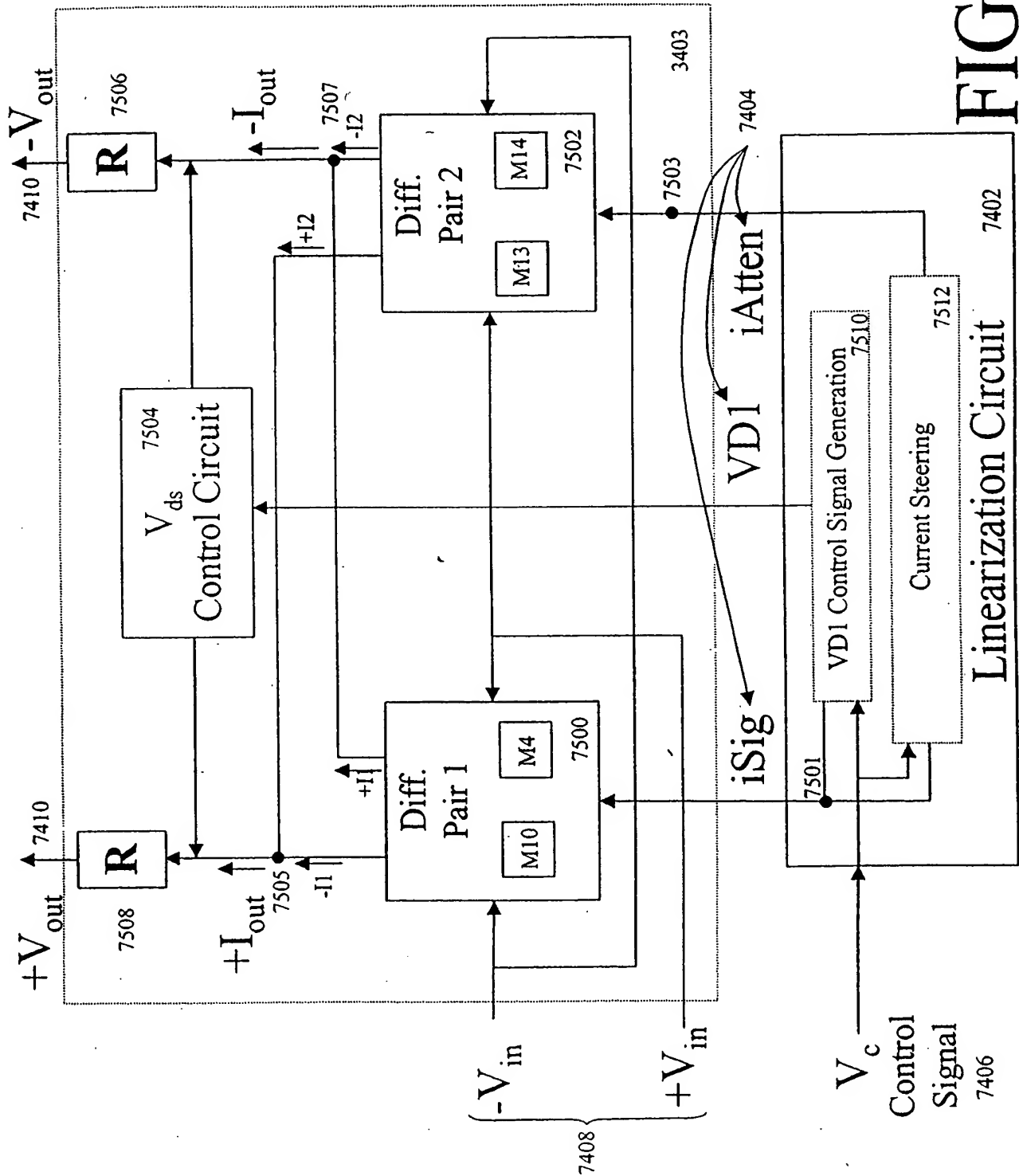


FIG. 75



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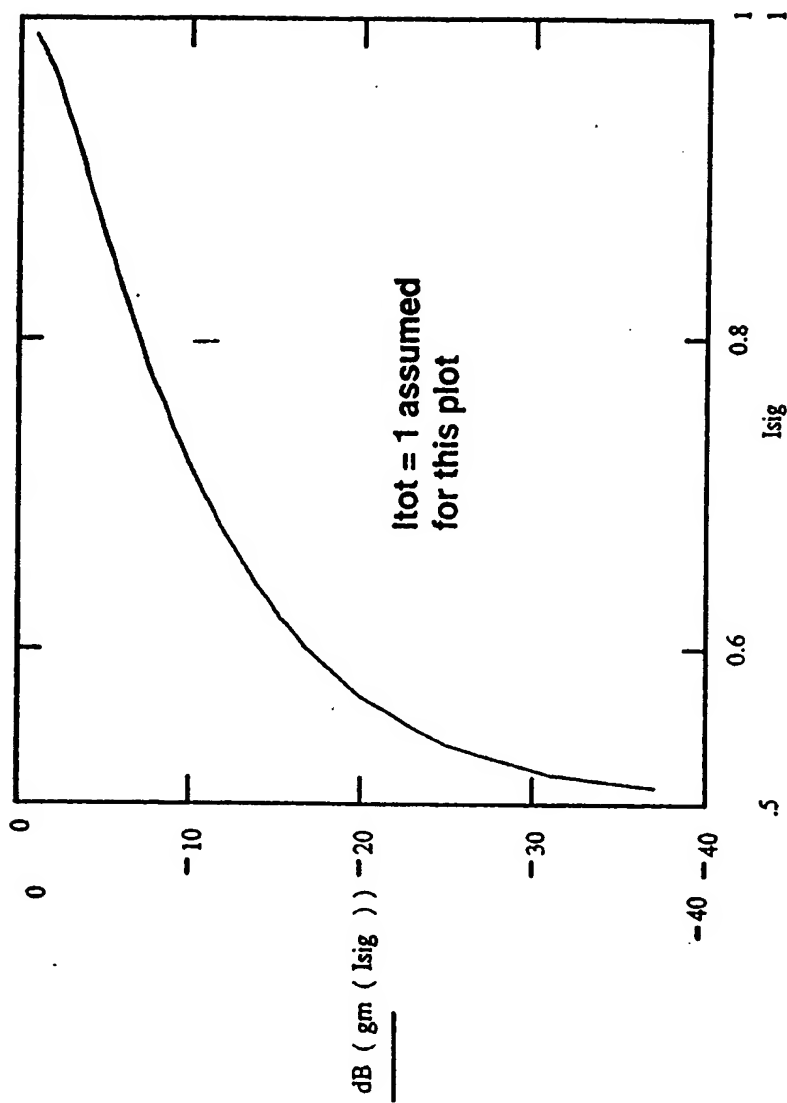


FIG 76

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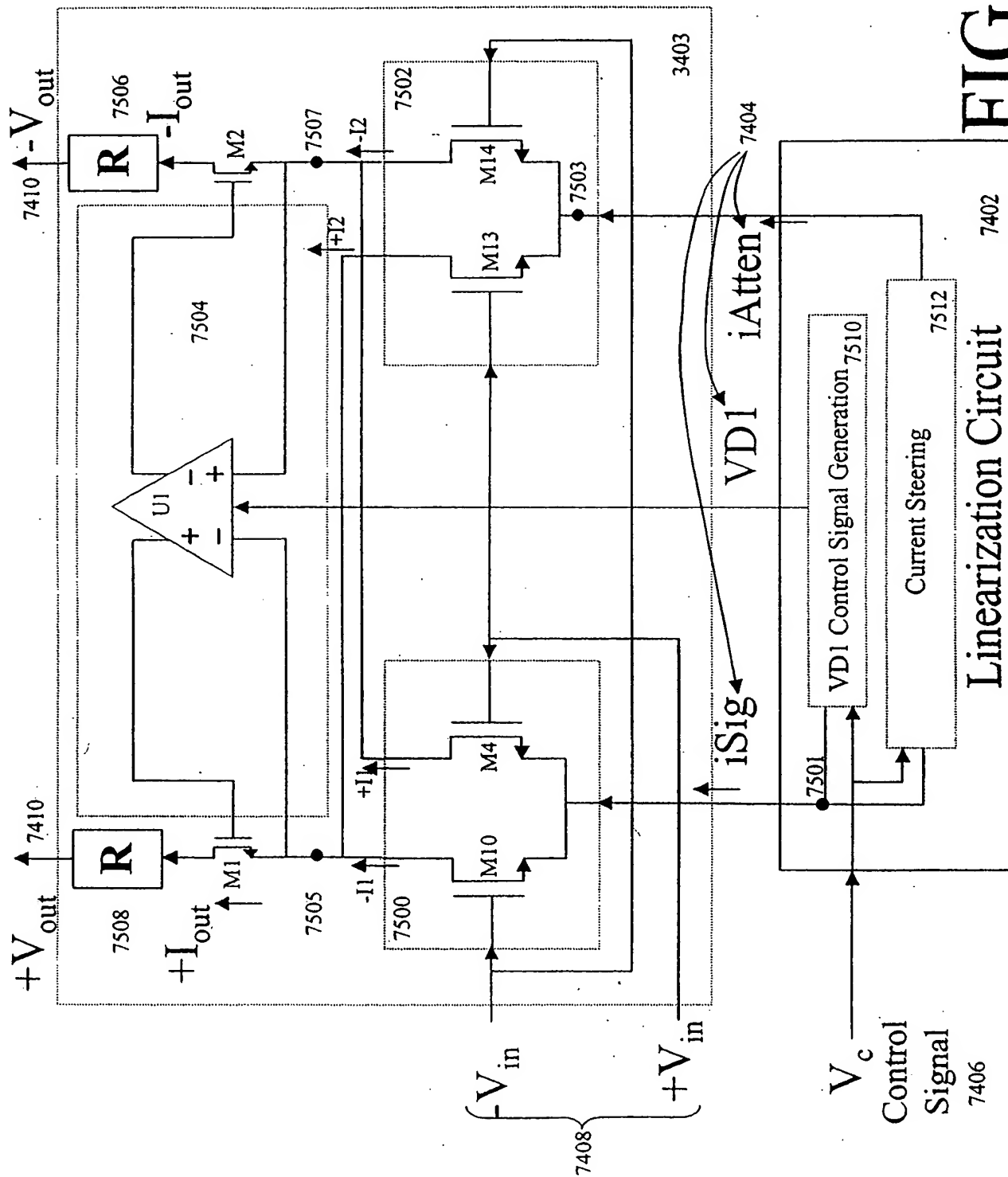


FIG. 77

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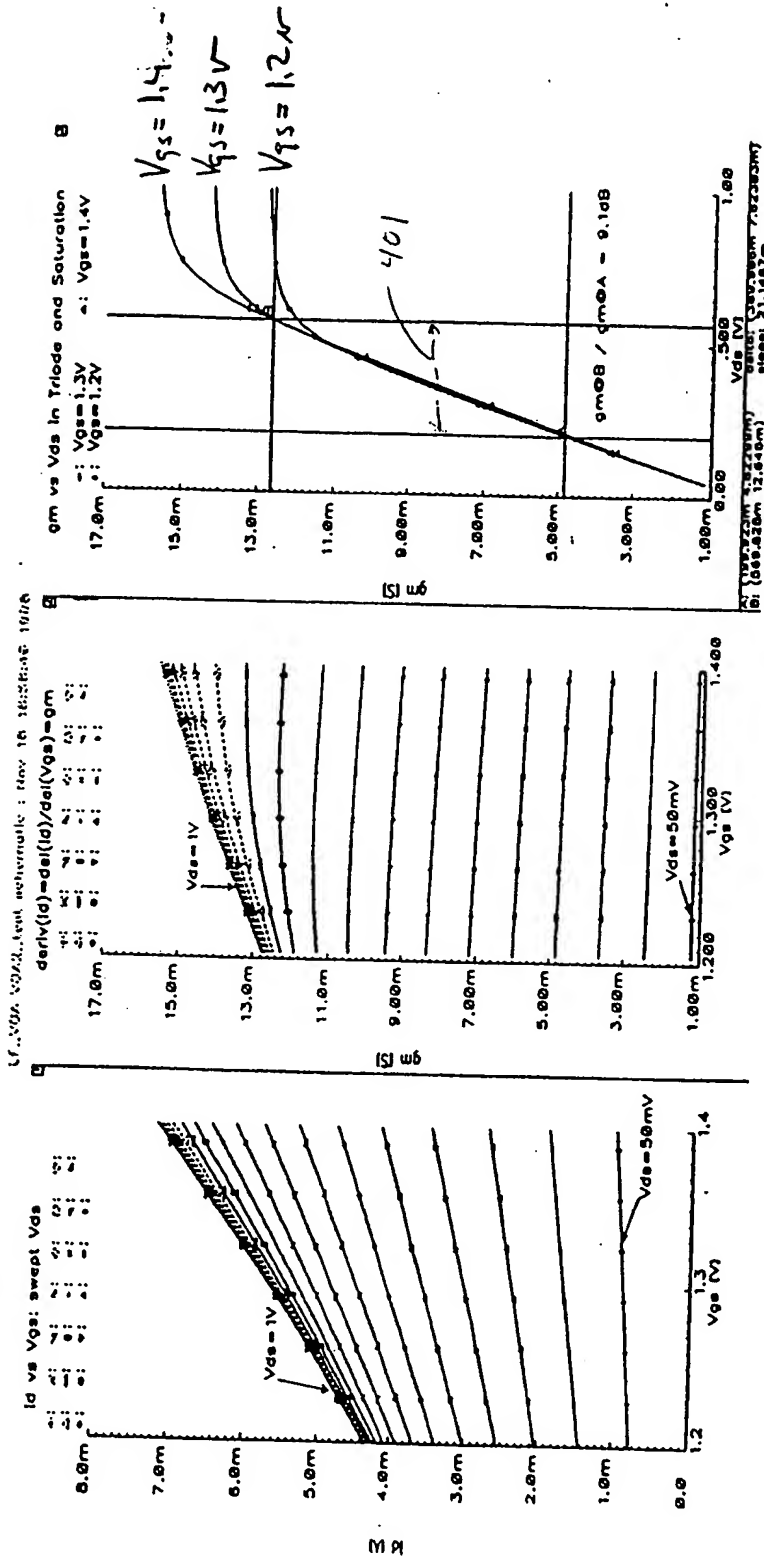


FIG 78a

FIG 78b

FIG 78c

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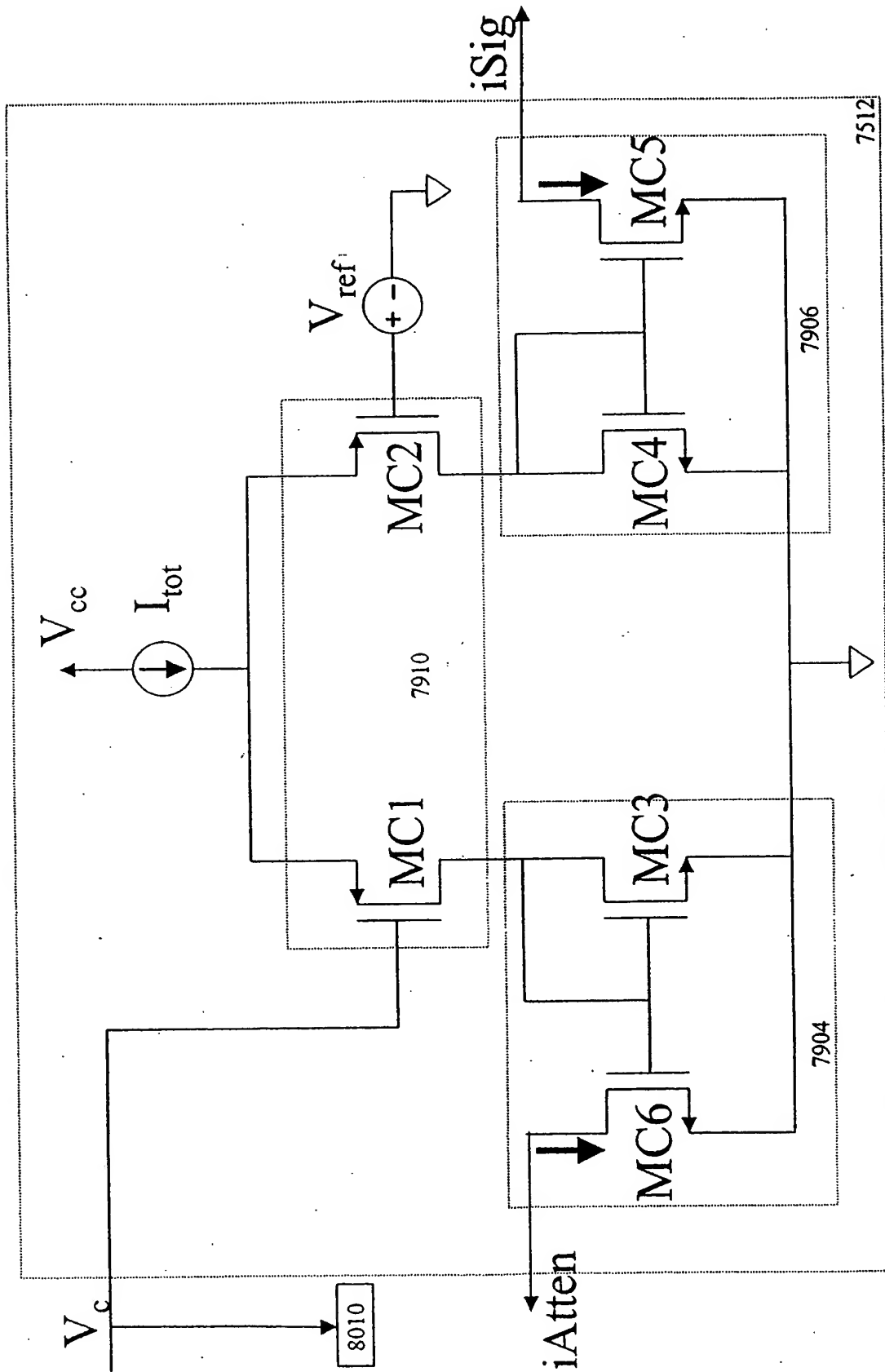


FIG. 79

